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THE

PUERPERAL DISEASES.

CLINICAL LECTURES

DELIVERED AT BELLEVUE HOSPITAL.

BY

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THIRD EDITION.

NEW YORK:
D. APPLETON AND COMPANY,
549 & 551 BROADWAY.
1876.

Entered, according to Act of Congress, in the year 1874,

By D. APPLETON AND COMPANY,

In the Office of the Librarian of Congress, at Washington.

PREFACE.

For nearly twenty years, it has been my duty, as well as my privilege, to give clinical lectures at Bellevue Hospital, on midwifery, the puerperal and the other diseases of women. This volume is made up substantially from phonographic reports of the lectures which I have given on the puerperal diseases. Having had rather exceptional opportunities for the study of these diseases, I have felt it to be an imperative duty to utilize, so far as lay in my power, the advantages which I have enjoyed for the promotion of science, and, I hope, for the interests of humanity.

I therefore have devoted the vacations of the past two summers to the work of selecting, fusing, and making homogeneous, the phonographic reports of my lectures.

In many subjects, such as albuminuria, convulsions, thrombosis and embolism, septicæmia and pyæmia, the advance of science has been so rapid as to make it necessary to teach something new every year. Those, therefore, who have formerly listened to my lectures on these subjects, and who now do me the honor to read

this volume, will not be surprised to find, in many particulars, changes in pathological views, and often in therapeutical teaching, from doctrines before inculcated.

In describing disease, I have conscientiously aimed "to hold, as 'twere, the mirror up to Nature;" so that the picture may be recognized at the bedside.

The therapeutics of the maladies discussed have received prominent attention; believing, as I do, that the grand mission of the physician is to relieve suffering, arrest disease, and save life.

In entering the room of a puerperal woman, every obstetrician must feel that the responsibility of the happiness of a family, and, it may be, the life of two of its members rest, in a great measure, upon his wisdom and judgment. This responsibility is multiplied to the clinical teacher by the number of his listeners.

Something of this feeling has had an influence in deterring me hitherto from publishing my lectures, until the experience of years should give the "courage of my opinions."

At the present day, for the first time in the history of the world, the obstetric department seems to be assuming its proper position, as the highest branch of medicine, if its rank be graded by its importance to society, or by the intellectual culture and ability required, as compared with that demanded of the physician or the surgeon. A man may become eminent as a physician, and yet know very little of obstetrics; or he may be a successful and distinguished surgeon, and

be quite ignorant of even the rudiments of obstetrics. But no one can be a really able obstetrician, unless he be both physician and surgeon. And, as the greater includes the less, obstetrics should rank as the highest department of our profession.

A growing appreciation of the importance of this department is demonstrated by the organization, within a few years past, of active and most efficient Obstetrical Societies in London, Edinburgh, Dublin, Berlin, Leipsic, New York, Philadelphia, Boston, and Louisville, and also by the publication of journals in the United States and in Europe, specially devoted to obstetrics and gynæcology.

The great success and popularity of such works as those by McClintock and Hardy, Johnston and Sinclair, are an evidence that the profession demands information which these works contain. It seems singular that no book has yet appeared, in the English language, to occupy the ground which I have attempted to cover. If this volume meet with a success which can be accepted as proof that it is wanted by the profession, it will undoubtedly stimulate others to work in the same field, and, in this way, at least, accomplish a positive good.

85 Madison Avenue, New York,
January, 1874.

PREFACE TO THE THIRD EDITION.

A NOTE from the publishers of this work informs me that only a few copies remain at their disposal, and that it is necessary to prepare a third edition for the press.

The rapidity with which the former issues have been sold, eight months having hardly elapsed since the work first appeared, the flattering reception which has been universally accorded to it by the medical press, both here and in Europe, the fact that it has been republished by the Messrs. Churchill in London and that I have been solicited to permit translations in German, French, and Italian — soon to appear in Berlin, Paris, and Milan—are accepted by the author as evidence that a special work on the Puerperal Diseases was demanded by the profession.

I have merely to add that this edition is essentially the same as the former issues, with such changes only as result from careful revision and correction.

85 MADISON AVENUE, NEW YORK,
October, 1874.

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PUERPERAL DISEASES.

LECTURE I.

PUERPERAL CONVALESCENCE.

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Gentlemen: In our lying-in wards, where we have monthly from forty to fifty or more cases of labor, you have the opportunity of studying clinically, and becoming practically acquainted with, every variety of puerperal disease, to a greater extent than is found anywhere else in this country. You have already seen most interesting cases of some of the forms of post-partum inflammation, of puerperal convulsions, mania, and puerperal fever. Before discussing the various pathological conditions incidental to the puerperal state, which you have seen and will see in our wards, let us first study normal puerperal convalescence. This includes two distinct classes of phenomena: first, the restoration of the pelvic organs to their normal state, which, during

gestation and parturition, have been the seat of extraordinary modifications in tissue, function, and position, second, the development of a new function, lactation, for the nutrition of the infant.

Puerperal convalescence is normal, when these two conditions are perfectly attained without injury to the health of the mother or child. During gestation, the organs concerned in this function are the seat of a most active evolution, which exerts an important influence over all the vital functions, and culminates in the process of parturition.

During the forty weeks of utero-gestation, the uterus enlarges from nearly three inches in length and one and three-quarters in breadth, to twelve or fifteen in length and nine or ten in breadth. It increases from about two ounces in weight, to twenty-five or thirty ounces. Its cavity, before impregnation, is less than one cubic inch, while, at the full term of pregnancy, it is extended to above four hundred cubic inches, and the surface of the organ increases from about five or six square inches, to nearly three hundred and fifty square inches. (Simpson.) Its serous tissue undergoes a corresponding extension; and, as this takes place without a decrease in thickness, it must be the seat of a much more active nutrition, to prevent its attenuation. Its lining, or mucous membrane, becomes actively hypertrophied, constituting the decidua, which, after parturition, is exfoliated, and a new mucous membrane is formed.

The reduction of the uterus after delivery to its normal size, its involution, as it is termed, takes place by fatty transformation of its component fibres, and absorption. The cicatrization of its internal surface is accomplished by the exudation of organizable lymph and the development of a new layer of mucous mem

brane. This rapid exposition of some of the physiological changes which take place during puerperal convalescence is necessary, in order that we may properly appreciate the clinical phenomena pertaining to this period.

During the first hours after delivery, the genital organs are more or less swollen and painful. The vagina is distended, soft, and bloody. It has, of course, been very much stretched by the passage of the child, but it is so elastic that it soon recovers its natural state. The anterior edge of the perinæum is often slightly torn in first labors, but, if it be not more than this, it is of no consequence, except that it may become the seat of absorption of septic matter.

The uterus should be felt firmly contracted, as a hard, round tumor, about the size of an infant's head, just above the pubes. It gradually diminishes in size, until it sinks into the pelvis. It ordinarily cannot be felt above the pubes later than from the sixth to the tenth day; when it can be felt later, this indicates arrest of involution, the cause of which should be investigated.

Professor Murphy divides puerperal convalescence into three periods: 1. The interval between the birth of the child and the commencing secretion of milk; 2. The period during which the function of lactation rises to its highest point of activity; 3. The period occupied in restoring the uterus to its original condition previous to conception. During the first hours after delivery, there should be complete repose. The patient, by proper management, should be secured a sound and refreshing sleep. If the labor have been a severe and tedious one, and in all cases where operative procedures have been required, I am in the habit of giving a full opiate; that

is, a grain of opium, or the equivalent of some of its preparations, as soon as the binder has been applied, and the soiled clothes have been removed. Every thing which would disturb or excite the patient should be carefully avoided, and she should be kept perfectly quiet.

Retention of Urine.—Before leaving a woman who has just been delivered, you should be very careful to direct the nurse, within a few hours, to try and induce her to pass the urine, as this precaution may save you from a good deal of subsequent trouble, and your patient from great annoyance and some suffering. Unless her attention be called to the subject by the nurse, she may not feel the sensations which ordinarily attend the distention of the bladder, and she should therefore be persuaded to make the attempt. Sometimes, by turning the patient upon her face and knees, she may be able to accomplish the result, when she could not in any other posture, but she should not be allowed to exhaust herself in fruitless efforts.

The retention may be due to loss of contractility of the muscular tissue of the bladder, a kind of paralysis from over-distention, or to a mechanical obstruction, the meatus or urethra being closed by tumefaction. The first condition is usually relieved by giving the patient, every fifteen minutes, for an hour or two, twenty drops of the fluid extract of ergot. After delivery, especially if the second stage be long, I always examine the bladder before leaving my patient, and, if I have reason to suspect that it contains much urine, I give the nurse some ergot with directions as to its use. It is, therefore, very rarely that I am compelled to use the catheter in the puerperal woman; but, when the retention is due to the second cause mentioned, the catheter is the only resource. As your text-books give

you minute directions as to the guides for introducing this instrument, I shall not detain you by a repetition of these rules. I will only suggest to you the great advantage of becoming perfectly familiar with these guides by the sense of touch, by availing yourselves of every opportunity for practice on the cadaver, as it has frequently happened that physicians have damaged their reputations and lost the confidence of their patients by their awkwardness or unskillfulness in using the catheter. When necessary, the catheter should be used every eight hours, until the patient is able to relieve herself.

It sometimes happens that the physician may be misled by the unintentional misrepresentations of the nurse and of the patient herself, as in the following case: I was called, some years since, in consultation with an excellent physician and highly-esteemed friend, to see a young lady, aged nineteen, whose first labor had terminated fifty-two hours before I saw her. She had slept none since her delivery, and I found her with a very sharp, irritable pulse, hot skin, flushed face, red eyes, excited manner, and tympanitic abdomen. She complained of violent headache and of intense pain over the hypogastrium, and, for some hours previous to my seeing her, she had been frequently delirious for a few minutes at a time. My friend, who was in attendance, in answer to repeated inquiries, had been assured, both by the nurse and the patient herself, that she had passed urine many times since her delivery, and that "there was no difficulty in that respect." A thorough and careful palpation of the abdomen was very difficult, on account of the great tympanites and exquisite tenderness on pressure; but I thought that I was able to detect, above the pubes, the outline of a large, elastic tumor,

quite different from the uterine tumor, which, at this period, I ought to be able clearly to define. I therefore asked permission to introduce a catheter, and drew off over five pints of very offensive urine. An anodyne was then given, the catheter was used every eight hours for a few days, and the subsequent convalescence was uninterrupted by a single unpleasant symptom. In our lying-in wards in this hospital, although our house-staff are usually on their guard as to this source of error, I have in several instances found a large quantity of urine in the bladder, the house-physician having accepted the statement of the patient that she had passed water very frequently. I learned a lesson on this point some twenty-five years ago. I was asked by one of my *confrères*, in the town where I then resided, to make a post-mortem examination of a woman who had died a few days after her confinement. He attributed her death to some obscure cerebral disease; but he also said that severe peritonitis came on soon after her confinement, which, he thought, he had successfully combated by venesection, blisters, opium, and calomel. For my present purpose, it is not necessary for me to detail the results of the autopsy farther than to say that I found in the bladder nearly a gallon of urine. This was considered very curious, as the patient was reported by the nurse to have passed water very frequently from the time of her confinement up to within two hours of her death. It was not for me to wound the feelings of my friend, who was many years my senior, by unkind comments, but I internally drew my own inferences and "made a note of it." Enough has been said to lead you to see the necessity for making a careful examination of the abdomen frequently after confinement.

After-pains.—Sleep is sometimes prevented by severe after-pains, which may come on soon after delivery. They may be even more severe than ordinary labor-pains, particularly in those who have borne many children. By proper management, much may be done by way of preventing their occurrence. They are usually the result of the presence of coagula in the cavity of the uterus, which distend its walls and excite spasmodic contractions. If firm, steady pressure be kept up over the fundus of the uterus during the time the trunk of the fœtus is expelled, and this pressure be not suspended until after the delivery of the placenta and the binder be properly applied, a permanent contraction of the uterus is secured, which so effectually closes the open mouths of the utero-placental vessels, as greatly to diminish the amount of blood poured into the cavity. If the second stage of labor be too rapid or too prolonged, I give a full dose of ergot (a teaspoonful of Squibb's fluid extract in half a wine-glass of water, for example), just as the delivery of the child is taking place. The precautionary measures which should always be adopted to prevent post-partum hemorrhage, are also, to a certain extent, a prophylactic against after-pains. When they come on a few hours after delivery, they may sometimes be speedily relieved by again making firm pressure over the fundus of the uterus, which causes the expulsion of coagula; but this method of relief should only be tried a few hours after delivery, as the pressure may excite irritation resulting in inflammation. Some preparation of opium should then be given. A great variety of different formulæ have been proposed for this purpose. My favorite prescription in these cases is ten grains of Tully's pow-

der,[1] repeated, if necessary, in four or five hours; but, in most cases, ten grains of Dover's powder, a tea-spoonful of elixir-paregoric or Dewees's camphor-julep, will probably accomplish the result as well.

Sometimes, a day or two after labor, severe after-pains are excited by the presence of flatus in the intestines. In these cases, the abdomen is tympanitic, and a slight touch causes severe pain, while the uterus cannot be felt. If the pressure be steadily increased, the pain diminishes until it entirely disappears. If the hand be now suddenly lifted up from the abdomen, the pain at once returns with great violence. If the pain, tympanitis, and tenderness on pressure, be due to inflammation of the peritonæum, the greater the pressure, the greater the pain. The after-pains due to flatus are most speedily relieved by turpentine-stupes and turpentine-enemata.

There are, also, some rare cases of after-pains which I have met with, that seem to be purely neuralgic in their character. There is no distention or tenderness of the abdomen, nor is the uterus enlarged. On the contrary, it is very firm, but quite sensitive on pressure. There is an entire absence of other symptoms, such as febrile reaction and constitutional disturbance, which attend inflammation of the pelvic organs. These neuralgic pains do not seem to yield to opiates in the fullest doses; but within a few years past I have treated them successfully by quinine, internally, and the application of chloroform-liniment externally. I generally

[1] TULLY'S POWDER.

℞. Pulv. g. camphor., Cretæ pp., Pulv. glycyrrh., āā ℈j.
Morphiæ sulph., gr. j.
M. Dose.—The same as the Dover's powder.

prescribe from five to ten grains of quinine night and morning, but this is rarely needed for more than a day or two. The liniment is the following: ℞. Chloroform, ʒj, lin. sapo. co., ʒ vj. M. Wet a piece of flannel of double thickness, large enough to cover the whole uterine region, and lay upon the skin, immediately covering the patient with the bed-clothes. The application, for the first moment, causes a disagreeable sensation of cold, which is at once succeeded by a burning, but not ungrateful heat. A patient whom I saw a few weeks since in consultation had been suffering intense agony for over forty-eight hours, and, in addition, she was experiencing the disagreeable effects of large doses of morphine that had been given her to relieve the pain and induce sleep. One dose of ten grains of quinine, with the application of the liniment I have just mentioned, gave her entire and permanent relief.

I should not omit to mention that, in some few cases, cramps in the legs seem to take the place of after-pains. I believe Drs. McClintock and Hardy were the first to call attention to this fact, which my own experience has verified in two or three instances. The cramps disappeared after the expulsion of coagula from the uterus.

The Lochia.—This is the term applied to the discharges which take place from the vulva from the time of delivery until puerperal convalescence is complete. In different women, who are perfectly healthy, there are great variations in the quantity, duration, and character of the discharge. It is at first sanguineous, being composed principally of the blood which oozes from the open mouths of the uterine veins. It then becomes greenish yellow, thick and oleaginous, and lastly, thin and serous. During the first twenty-four hours, the patient usually

soils ten or twelve napkins. It generally is considerably less on the second day, and not unfrequently the discharge is temporarily suspended for a few hours when the function of lactation is at first fully developed, a fact which you should remember, as nurses are sometimes alarmed by such an occurrence, and injudiciously excite the apprehension of the patients on this account. The duration of the lochia varies from a few days to four or five weeks. As a sanguineous discharge, it usually continues but a few days. If it be prolonged three or four weeks, the probability is that it is due to some local lesion, as ulceration of the cervix, or lacerations which have occurred during labor; and local exploration should be made to determine the exact character of the lesion. The suppression of the discharge at an early period after labor is not to be regarded as an unfortunate symptom, unless it be attended with other symptoms of an inflammatory nature. It usually ceases much earlier in those who are delivered of still-born children, when the fœtus has been dead some days previous to labor.

Although there is a peculiar odor ordinarily attending the discharge, yet, if it be decidedly offensive, this condition demands particular attention. It indicates the decomposition and putrefaction of coagula or some foreign substance in the uterus, or some graver and more serious lesions of the uterine tissues. To correct this odor, the following prescription is perhaps as efficient as any you can use:

℞.	Acidi carbolici glacial.,	ʒ j.
	Glycerin.	ʒ j.
	Aquæ puræ,	℥ vij.

M. S. A tablespoonful in eight ounces of warm water, twice a day, as a vaginal injection.

I am in the habit of directing the above injection, somewhat weaker, for the first few days after confinement, in all cases in private practice.

If the discharge have a coffee-ground color, with a fetid odor, it should lead to the suspicion of gangrenous inflammation of the uterus or vagina, and the above injections should be used several times a day. Sometimes the discharge becomes purulent. The source of this may be in the vagina, or in the cervix, or the cavity of the uterus; and, after the lochia have ceased, and the discharge has become a purulent leucorrhœa, an examination with the speculum should be made to determine its source. Otherwise, your patient may remain for a long time more or less an invalid after her confinement, seriously compromising thereby your reputation.

The lochial discharge usually decreases in a very marked degree for a few hours, on the second or third day, during the existence of what is termed the milk-fever. It is sometimes entirely suspended at this time, and the nurse should be prepared, by your instructions, for such an occurrence. The turpentine-stupe placed over the hypogastrium, and retained as long as the patient can bear it, will usually restore the discharge. On the other hand, the sanguineous discharge may continue too long and be of too bright a color. Examine the uterus, and ascertain whether its size be progressively decreasing. Keep your patient rigidly in the horizontal position, and free from all emotional excitement.

If the uterus remain so enlarged for a few days after parturition, that it can be readily felt above the pubes, and there be no symptoms of other disease, except those of delayed involution, you will probably

accelerate this process by the use, for one or two days, of a prescription like the following:

℞. Ext. ergot. fl. (Squibb's),
Tinc. nucis vomicæ,
Tinc. ferri chlorid.,
Tinc. cinnamom. cort., } āā ℥ j

M. S. A teaspoonful in a wine-glass of sugar and water, four times a day.

If your patient be feeble, delicate, and anæmic, and the lochial discharge continue somewhat free and of a bright color, after the uterus is well contracted down in the pelvic cavity, you will find a tonic course of great service, as in the following:

℞. Quiniæ sulph., ℈ j.
Ferri sulph., gr. xv.
Ext. nucis vomicæ,
Pulv. capsici, āā gr. v.
M. Ft. pil. (argent.), No. 12.
S. One thrice a day after eating.

You will frequently see this condition associated with a temporary profuse lactation, which is an additional drain upon the system, and the patient becomes very nervous and irritable, and suffers from head-ache and insomnia. You may then add to the formula I have just given, four grains of opium; and she will take one-third of a grain of opium in each pill, or one grain in twenty-four hours.

The normal duration of the lochia varies greatly in different individuals. Sometimes the nurse, and even the patient herself, is greatly alarmed from an apprehension that the lochia have ceased at too early a period after delivery. The early cessation of the lochia, unaccompanied by any other symptom of puerperal disturbance, is not a cause for anxiety, but it may be a

symptom of great importance in connection with the various puerperal diseases, which we shall study by-and-by. But I will here say that I have frequently seen, in healthy women, the lochia entirely cease in a few days after confinement, and the patient has had a perfectly normal and rapid convalescence; while, on the other hand, I have often seen most grave and even fatal puerperal disease, in which the lochial discharge has continued throughout, without any marked change either as to quantity or character. It is well to remember that, as in abortion, if the ovum be some time dead previously to its expulsion, there is usually very little hemorrhage; so, at full term, if a woman be delivered of a child which has been some days dead, the lochial discharge is usually much less, and ceases at an earlier period than is usual.

Secondary Hemorrhage.—In some cases, which are fortunately rather rare, a profuse and dangerous discharge of blood may come on a few days after delivery. The term secondary hemorrhage has been applied to those cases of profuse sanguineous discharge which take place any time, from six hours after delivery up to the end of the month. These hemorrhages are often serious, and many cases have been published which have terminated fatally. They are but slightly noticed in your obstetrical text-books, but excellent papers on this subject have been published by Dr. A. H. McClintock, of Dublin, and the late Mr. Roberton, of Manchester. They arise from a variety of causes, which it is very important to thoroughly understand, in order to treat them successfully. I shall describe these causes, and the appropriate treatment of each, in the order of frequency, according to my experience, in which they occur.

I. *From simple relaxation of the uterus.* This occurs most frequently within twenty-four hours after delivery, and I have never met with it later than the third day. Although, in this hospital, the obstetric staff and nurses are drilled to the habit of securing perfect and permanent contraction of the uterus, by following its fundus with pressure of the hand during the expulsion of the trunk of the fœtus; by the administration of ergot before the delivery of the placenta; by continued pressure afterward, until the uterus is felt to be firmly contracted; and then the careful application of the binder, never for a moment leaving the patient until permanent contraction is apparently secured, yet this form of secondary hemorrhage does occur here, I should think, at least three or four times a year. The patients in whom this accident occurs are usually those whose systems have been broken down by their habits of living, by destitution, by mental depression, or by long-protracted labor, sometimes continuing for many hours before they are brought into the hospital. In private practice, it seems to arise generally either from some imprudence on the part of the patient or of her nurse, in raising her too early to the erect posture in bed to change her clothing or to assist her to empty the bladder. I am always very minute in my directions, in case it should be necessary, for any reason, to raise the patient for a few moments to the erect position, that, on laying her down again, the binder should be unfastened, and the uterine tumor carefully examined; and, if it be found at all relaxed, firm pressure should be made with the hands for a few moments before the binder is readjusted.

In one case, a most fearful and critical secondary hemorrhage seemed wholly due to an emotional cause

The patient, a young and healthy primipara of nineteen, was devotedly attached to a gay husband, who did not at all deserve such love from any woman. During her labor, she was constantly reiterating her desire that her child should prove to be a boy, asserting that if it were not, she should wish to die, as her husband would neither love her or her child. At six in the morning, she was safely delivered of a fine girl. She at once demanded, with a fearful earnestness, to know the sex of the child. I jokingly replied that I could never tell the sex before they were fifteen or sixteen years old; but, after I left the patient, the nurse boldly lied, and assured her that the child was a boy. Her condition was in every respect perfectly satisfactory, until the next evening, when her husband returned from a yachting trip, and, brutally expressing his disgust, informed her of the sex of the child. The nurse noticed, in a few moments, that she was very pale and breathing badly, and at once discovered that her bed was flooded with blood. I never have seen a patient recover from so fearful a hemorrhage. For days her life literally seemed to hang upon a thread, and for several months she had the most bleached, pallid-looking countenance that I have ever seen in a living woman.

Before I point out to you what you should do in such cases as these, you will indulge me in a slight digression, for some general remarks which will have a bearing on many of the subjects which I shall have the honor to discuss with you. In no department of medical practice, not even in surgery, is there so great a liability to the occurrence of sudden emergencies where success of treatment depends wholly upon the promptness and efficiency with which the resources of our art are applied. And in some of the most rapidly dangerous

emergencies of obstetric practice, these resources are absolutely successful in averting danger. I could give you many illustrations of the truth of this remark, but it is unnecessary, as we shall have frequent occasion to refer to them hereafter. Let me, therefore, strongly impress upon you the importance of having fixed principles of conduct thoroughly settled in your minds for every obstetric emergency that you may encounter. Then you will be able to act promptly, and without doubt or hesitation. You can act coolly yourself, give directions to others in a quiet but firm manner, and thus inspire confidence in the attendants and friends who are present. This greatly assists in keeping up the *morale* of the patient, and may be the essential element of success, without which your physical resources might fail. Therefore, in your early practice, begin the habit of asking yourselves, in every obstetric case that you attend, what you would do, should it prove to be placenta prævia—if convulsions should occur—if post-partum hemorrhage should follow—and so on. Have the answers to these questions well settled in your minds. You will thus avoid all danger of "losing your head" in the lying-in room, as I have often heard physicians accused of doing, while you need not fear the charge of acting impulsively. Such charges will not damage you if the impulses be the results of careful, well-weighed previous study, and turn out successfully. I will add also: begin your professional life by training your senses, sight, hearing, touch, so that in a moment, as it were, you can take in all the external features of the case. Then teach yourselves how to ask questions with a point, meaning, and logical sequence to them. It is with physicians, as it is with lawyers; one learns more essential truth in regard to a case by ten ques-

tions rightly put than another, by fifty vague, motiveless, inconsequential inquiries.

To resume our special topic, I shall now give you some general axioms with regard to puerperal secondary hemorrhage, from relaxation.

(1.) If the hemorrhage occur within seventy-two hours, at once unfasten the binder, and carefully examine the uterine tumor.

(2.) Make a careful vaginal examination. This rule should be absolute, in all cases of secondary hemorrhage.

(3.) While making these examinations, take the opportunity to learn all about the history of the attack.

Having settled the question, that the uterus is relaxed, and that the blood has been poured out from the open mouths of the utero-placental vessels, it is no matter whether this relaxation be due to constitutional feebleness, to exhaustion from protracted labor, to emotional excitement, to physical imprudence on the part of patient or nurse, the result is practically the same, and so are the indications for treatment. Now, what shall you do? I will give you succinctly the directions that I would give to one of my house-staff under such circumstances:

(1.) Remove all clots from the uterus and the vagina by firm pressure on the uterus, and by the fingers in the vagina.

(2.) If the hemorrhage continue, keep up the pressure, and use every resource of reflex action to stimulate uterine contraction. If ice be readily accessible, introduce lumps into the vagina.

(3.) Inject very carefully, and without force, into the uterine cavity, a half-ounce of the solution of the

persulphate of iron, diluted with an equal quantity of water.

(4.) If your patient show no sign of shock from loss of blood, give thirty drops of Squibb's fluid extract of ergot with twenty drops of the tincture of nux-vomica. Repeat every half-hour until well assured that the uterus is well contracted. As a general rule, not more than two or three doses will be necessary.

(5.) If the patient exhibit shock from loss of blood, do not give the ergot until reaction is established. First give twenty drops of laudanum or the equivalent dose of whatever opiate you may have at hand. Give some alcoholic stimulant in small quantities, repeating it at short intervals. When reaction is established, then give the ergot and the nux-vomica.

(6.) Before leaving, give minute and specific directions to the nurse as to watching the uterus, moving the patient, and such other points as the special features of the case may indicate.

II. *Secondary hemorrhage may occur from retention of a portion of the placenta.*

Hemorrhage from this cause is very rare in this hospital, but I meet with it not infrequently in consultation practice. It is very far from the truth to say that this always arises from the neglect or the ignorance of the medical attendant, for this casualty has occurred in the hands of some of the ablest and most eminent obstetricians, who have reported numerous fatal cases of hemorrhage from this cause. But I cannot impress upon you too strongly, in all cases where the artificial removal of the placenta is required, to exercise the greatest care to remove the whole of it, if this can be accomplished. In some cases of very close

and intimate morbid adhesion, it may not be possible to accomplish this. But this I will say in unqualified terms, that every physician should know whether or not he has left a portion of the placenta behind, and he is justly censurable when he is ignorant on this point. Hemorrhage from this cause is liable to come on at any period, from the third day up to the end of the month. Indeed, some cases, and even fatal ones, have been reported where the hemorrhage did not recur until five or even six weeks after delivery. I shall have occasion, hereafter, to speak of septicæmia, another danger from retention of a portion of the placenta, but at the present time I shall confine my remarks to the hemorrhage. This results, from the cause mentioned, chiefly in the three following methods: (1.) By preventing complete and entire contraction of the uterine fibres, at that point where a portion of the placenta remains adherent; (2.) by keeping up an increased determination of blood to the organ, and thus retarding involution; (3.) when the retained portion is detached, whether three days or three weeks after delivery, the utero-placental vessels are left open to pour out blood. When you know that a portion of the placenta has been left behind, you will of course be on the alert to prevent hemorrhage, and to arrest it, should it come on. It is to be inferred that you have secured as complete contraction as possible, during the first three days. Then I should recommend to you, as a precautionary measure, to give the ergot and nux-vomica thrice a day for three or four days, as I believe that this not only assists in keeping up the contraction of the uterine fibres and in diminishing the capillary circulation of the uterus, but also that it accelerates that metamorphosis of tissue which we call involution. I may, at

some future time, give you my reasons for believing that a metamorphosis of retained placental tissue occasionally takes place, as normally occurs in the uterine tissue. But, as we cannot always be sure of this result, it will be well for you to order the vaginal injections of carbolic acid, glycerine, and warm water, to be carefully but thoroughly used twice a day, as a prophylactic measure against septicæmia.

When hemorrhage does come on from this cause, at once make a vaginal examination. If you feel the blood coming from the uterus, and the os be contracted and somewhat firm, then, I should say, tampon the cervix uteri with the compressed sponge-tent, if you have it with you or it be easily accessible. Then apply a pad and binder firmly over the uterus. It is true that the uterus has been distended by the accumulation of blood, and patients have died from internal hemorrhage, even two, three, and four weeks after parturition. But I think this danger can be effectually guarded against, by the proper use of the pad and binder, and by frequent examinations of the uterus, to see that it is not enlarging. I have applied the sponge-tent with success the third day after labor. I never allow the tampon to remain in the cervix more than six or eight hours. It frequently is the case that, when the tampon is removed, the cervix is sufficiently dilated to permit the examination of the cavity of the uterus, and it is then sometimes possible to remove with the fingers the retained portion of the placenta. Then apply tightly the binder, and inject the solution of persulphate of iron and water.

If, on vaginal examination, at the time of the hemorrhage, the os is found patulous and feels at all sloughy, do not tampon, but inject the solution of iron and water

as I have before mentioned, and see to it that the pad and binder are well applied.

Whether you use the tampon or the injection of the solution of persulphate of iron, immediately afterward, direct that an enema of one ounce of the oil of turpentine with a half-ounce of olive-oil be slowly thrown into the rectum and retained there as long as possible. From a long experience in the use of this agent in this way, I am thoroughly convinced of its great value as an hemostatic and as a stimulant to excite uterine contraction.

III. *From the Retention of a Coagulum in the Uterus.*—If the condition of the uterus be well watched for twenty-four hours after delivery, this, as a cause of secondary hemorrhage, must occur very rarely. I hardly need say to you that, as long as there is a clot in the uterus, there is a danger of hemorrhage. Madame La Chapelle relates one case of hemorrhage from this cause, on the eighth day after delivery, which resulted in the death of the patient in a few hours. Collins, Burns, and McClintock, each refers to this as a cause of secondary hemorrhage. I have seen two cases in this hospital, and one in consultation-practice, where a very considerable hemorrhage, a few days after labor, has suddenly come on, a large and pretty firm clot has been expelled, and the hemorrhage has at once ceased. You should always think of this as a possible cause, when you can find no other, and especially if you find the uterus large, and that it hardens under firm pressure. The indication, then, is obvious; excite the uterus to expel the clot, and then to contract firmly.

IV. *From Polypus of the Uterus.*—A great many cases have been published by obstetric writers where polypus has complicated labor and the puerperal state.

In two instances in this hospital, I have applied a ligature, and then excised a polypus during labor, and have had no farther trouble from this source. In a third case, a woman had a pretty severe hemorrhage on the night of the fourth day after the birth of her seventh child, which was apparently controlled by the means used by the house-physician to the lying-in wards. There was no repetition of the hemorrhage until the night of the ninth day, when it again came on so profusely, and continued with so much severity, that I was sent for at four o'clock in the morning. As the house-physician had given ergot, applied ice in the vagina, compressed the uterus, and plugged the vagina, without apparently lessening the hemorrhage, I removed the tampon, and made a thorough examination. Just within reach of the point of my finger, high up within the cavity of the uterus, I could feel a firm, smooth substance, which seemed to be movable; but I was unable to decide in my own mind what this substance was. So I thoroughly tamponed the cervix uteri with cotton-wool, packing the vagina with layers of the same material. I directed an enema of turpentine and olive-oil, to be retained in the rectum as long as possible. The patient seemed to be too feeble and exhausted to bear ergot, and I therefore ordered ten drops of laudanum and a half-ounce of whiskey, to be given at once, and repeated in one hour if necessary. On visiting the hospital at nine the next morning, I found the general condition of the woman very slightly improved from what it was four hours before; but, in spite of the plugging, blood had again begun to ooze pretty freely from the vulva. Removing all of the plugging, on a second examination, I could easily feel a polypus in the cervix. Placing the woman in a proper

position, I seized the polypus with the vulsella forceps, and pulled it out down, which required some force, and then excised it. The polypus was one-third larger than my thumb, with a pedicle about the diameter of my little finger. I had, previous to the operation, prepared a little pledget of cotton-wool, attached to a strong thread. As soon as I had excised the pedicle, I saturated this pledget with the solution of the persulphate of iron, and, by means of Simpson's sound, I pushed it up as far as possible into the cavity of the uterus. I did not then tampon the vagina, as I wished to know at once, if hemorrhage should again come on, but from this time she did not lose an ounce of blood. The next day she suffered from severe pains in the uterus, which she described as worse than any pains that she had ever suffered in childbirth; but these ceased at once as soon as the pledget of cotton was pulled out. I felt very great anxiety regarding the issue of this case, not only because several cases of death had been reported as the result of the operation for the removal of polypus in puerperal women, but also because puerperal fever was then endemic in our wards. But this woman recovered, without a single unpleasant symptom after the pledget was removed from the uterus.

I have seen three other cases in which secondary hemorrhage from polypus occurred during the puerperal period; but in these, the hemorrhage was controlled by ergot and other means, and the operation for removal was not performed until some weeks later. Notwithstanding the fact that a number of fatal cases have been reported as resulting from the operation for the removal of a polypus during the puerperal period, I give it as a rule that the polypus must be

removed if the hemorrhage cannot be arrested by other means.

V. *From Inflammatory Ulceration of the Cervix.*—Dr. Henry Bennet, of London, in his classical work on "Inflammation of the Uterus," was the first to specifically assign this as a cause of secondary hemorrhage. There is no doubt of the correctness of the opinion enunciated by Dr. McClintock, that this condition of the cervix uteri is much more frequently the cause of a profuse and long-continued lochial discharge than of a true secondary hemorrhage. But I am sure that I sometimes meet with sudden actual hemorrhage due to this cause alone, as the treatment of the ulceration arrests the hemorrhage just as effectively, as in other cases it arrests the profuse and long-continued lochial discharge. I am certain, also, that this condition exists much more frequently in puerperal women than most physicians, even at the present day, seem to believe.

VI. *From Lacerations of the Vagina or Vulva, involving Varicose Veins or Arteries.*—When the laceration takes place, the parts are frequently so compressed by the fœtus, that the open vessels are blocked up by coagula. Some hours, or it may be some days, after delivery, these coagula give way, and we have hemorrhage. Several such cases have occurred in my service here. In one case, on the second day after labor had terminated, the hemorrhage came on so gradually that it was not discovered until the patient began to exhibit the constitutional signs of loss of blood. The house-physician was puzzled on finding that the uterus was well contracted, and that the blood apparently did not come from this organ. I was sent for, and, on making a careful and prolonged examination, I found a jet of blood spurting from a small artery at the inferior

border of the right labium. A ligature was applied, and we had no farther trouble with the case. Other cases, similar in their character and history, will be alluded to in my lecture on lacerations of the perinæum.

VII. *From Partial or Complete Inversion of the Uterus.*—While it has been my great good fortune to have met with but one case of secondary hemorrhage due to this cause, yet I have seen a sufficient number of cases of inversion, partial or complete, subsequent to the puerperal period, to make me feel strongly that there is blame somewhere, when, at this day, any woman is permitted to suffer from this trouble, weeks, months, and years, after it has occurred. I hold that it would be unpardonable in any physician to overlook this accident, and to permit his patient, either to drag out a miserable existence, or to die from hemorrhage.

There are several other causes of secondary hemorrhage, reported by authors, and I will therefore mention them, although I have never seen such a result from the causes assigned. These are:

VIII. *Premature sexual intercourse.*
IX. *Malignant diseases of the cervix.*
X. *Pelvic cellulitis.*
XI. *Obstinate constipation* (*?*).
XII. *Functional disorders of the liver* (*?*).
XIII. *Distended bladder.*
XIV. *Sub-involution.*

LECTURE II.

DIET OF PUERPERAL WOMEN.

The puerperal period does not require an abstemious diet—Good, nutritious, easily-digestible food should be taken in sufficient quantities—Many puerperal disturbances are due to exhaustion and inanition—Laxatives—Routine practice of giving castor-oil on the third day—Castor-oil not to be given when there is a tendency to hemorrhoids—Hemorrhoids during gestation—The predisposing and exciting causes of—Treatment during gestation—When they are developed by labor—During the puerperal period.

GENTLEMEN: The theory that a puerperal woman is in an inflammatory condition, or in a state predisposed to inflammation, has, in a great measure, governed the profession, and has been inculcated by most of the obstetric authorities, from Celsus down nearly to the present time. They have consequently taught that a puerperal woman should be restricted to what was termed an antiphlogistic diet. I should, however, mention, as one of the prominent exceptions to the above remark, "the judicious" Denman, whose rule was to place his patient at once upon a regimen accordant with her previous habits.

At the present time, a change of practice, more in accordance with sound physiological reasoning and good sense, is rapidly taking place. Dr. Graily Hewitt, of London, has written forcibly on this point; and a discussion on this subject, in the Edinburgh Obstetrical

Society, plainly demonstrates that the routine practice, which restricted the puerperal woman to gruel, tea, and toast, for three days after labor, and a bill of fare but slightly extended until after the ninth day, is not the rule at the present time. Some eighteen years ago, I was led to carefully review this whole subject, with the result of an entire change in my theory, teaching, and practice; and the opinions I then formed have since been fully confirmed by close and conscientious observation, based upon an extensive clinical experience. Is not the theory a strange one, that the organs connected with parturition will be more rapidly restored to their condition prior to conception; that the metamorphosis of tissue, called involution, will be more easily and effectively accomplished, and that the new function of lactation will be more surely and perfectly established, by depriving the system of its accustomed alimentation! I cannot doubt that in all ages there must have been some whose practice was governed by a sound, intuitive judgment and good sense, and who have therefore freed themselves from the fetters of professional tradition, and followed a rule similar to that inculcated by Denman.

I should say, in general terms, give the puerperal woman as good nutritious food as she has an appetite for, and can easily digest and assimilate. You will at first find many nurses who will not accept these views, and they may fail to fully carry out your directions in this particular; but my experience has been that, after a time, the intelligent ones become enthusiastic converts to this course. The woman, exhausted by labor, first needs rest. This gained, as soon as she shows any desire for food, give that which is the most acceptable to her, and which will best sustain her—a cup of good,

clear beef-soup, or of chicken or mutton broth. There are those whose instincts or habits lead them to prefer a cup of tea, or gruel, or panada. Very well, only insist that they take enough. Then, as soon as the appetite will permit, guided only by this and the general condition of the woman, and not by the question of time, whether it be the third or the ninth day, gradually give solid food, as birds, poultry, tenderloin of beef, or a mutton-chop. I have had patients eat a good piece of tenderloin steak, the day after labor, with a relish and with happy results. Of course, I only advise such plain, nutritious, and digestible food, as good sense would suggest, but give enough of this kind. By following this course of regimen, I believe you will find that your patients rest and sleep better, and their functions are established with less disturbance, than they would be with a spare or insufficient diet. Since I have adopted this method with my puerperal women, I am very sure that I have much less frequently met with those annoying and troublesome nervous phenomena that so commonly follow parturition, as the nervous system is then apt to be in a condition of exalted susceptibility. The function of lactation is thus generally established without that disturbance of the system which was called milk-fever, and was formerly so common. It is certainly more in accordance with sound physiological principles to feed puerperal women upon easily digestible nutritive articles, than to administer that which contains but little nourishment and a larger amount of undigestible residue. We shall see, by-and-by, that there are many puerperal diseases mainly due to exhaustion and inanition. In short, I will say that I have seen much suffering and many diseases in puerperal women, where one of the chief elements was defective nutrition; but I

have never seen the slightest evil result from good, ample, judicious alimentation.

Laxatives.—In many women, after confinement, the bowels are not opened until some means are used for this purpose, and castor-oil is undoubtedly given more frequently than any thing else. I suppose that more than one-half of the women confined in this country take a dose of castor-oil on the second or third day after delivery, and I see that this is recommended by some of the most eminent German obstetricians. Now, I do not consider this routine-practice judicious. Many patients do not require any laxative, the bowels acting spontaneously on the second or third day. I therefore wait for some indication of the necessity of a laxative before prescribing one, and then I very rarely select castor-oil, because, to most women, it is an exceedingly nauseous, disagreeable medicine, and where there is any tendency to piles, which is frequently the case after labor, it is one of the worst agents that can be selected. I have frequently observed severe suffering from piles, following the evacuation of the bowels from a dose of castor-oil. For these reasons, I have almost wholly given up its use as a laxative after confinement. The choice of the agent to be used for this purpose must depend upon the special indication in each individual case. If a laxative be required simply on account of torpor of the bowels, an enema of warm water and castile-soap, thrown up the rectum very slowly and gently, is much better than any medicine administered by the mouth. But where the patient has a great aversion to an enema, as you will find some do have, two of the following pills will usually act efficiently and without causing pain:

℞. Ext. colocynth co., ℈j.
Ext. hyoscyami, gr. xv.
Pulv. aloes soc., gr. x.
Ext. nucis vomicæ, gr. v.
Podophyllin p.,
Ipecacuanha, āā gr. j.
M. Ft. pil. (argent.), No. 12.

Let me here say that, for reasons so obvious that I need not here enumerate them, it is always best to give laxatives to puerperal women, in the morning, before breakfast. I am very much in the habit of ordering, the second morning following the action of the medicine, after the first dose of two pills, one to be taken daily, until the bowels acquire the habit of moving spontaneously.

When there are flatulence and severe after-pains, in consequence of constipation and intestinal irritation, I have found the following an excellent combination:

℞. Ext. sennæ fld.,
Syr. zingib., āā ʒ vj.
Tinc. jalap., ℥ ss.
Tinc. nucis vomicæ, gtt. 40.
M. S. A table-spoonful in a wine-glass of sugar and water.

I shall mention other laxatives in cases where a derivative action is required, when I discuss milk-fever and the other disturbances accompanying lactation.

I take the present opportunity to make some remarks on *hemorrhoids in pregnant and puerperal women.*

During gestation, we have, as a predisposing cause of this disorder, pressure of the gravid uterus upon the rectum, which retards or prevents the return of the blood from the hemorrhoidal plexus of veins to the inferior mesenteric veins. But this exists as a cause in

every pregnant woman; and therefore some other element seems to be necessary for the development of the disorder. This is either constipation or diarrhœa. In constipation, there is probably the same atony of the coats of the hemorrhoidal veins as exists in the muscular coats of the rectum, and the pressure of accumulated fecal matter contributes to make these veins varicose, and, if long continued, to develop the hemorrhoidal tumors. The effect of a purgative is to stimulate an abnormal peristaltic action in precisely an opposite direction to the blood returning from the hemorrhoidal veins.

Some, who are subject to piles, are never constipated, but have habitually a loose, relaxed condition of the bowels, the same atony of the venous coats resulting from the irritation and exhaustion of diarrhœa as exists in constipation. So, therefore, either constipation or diarrhœa may develop hemorrhoids.

If the hemorrhoidal veins have become varicose during the later periods of gestation, the tumors may be developed by long pressure of the fœtal head on the rectum during labor. The veins sometimes swell enormously at this period, as they are probably weakened by the distention they have suffered during the progress of the labor, and regain with difficulty the power of contracting at this time. In many women, hemorrhoids are first developed by the action of the purgative given two or three days after confinement.

I shall now describe the treatment which I have found the most successful in each of the above conditions, and which I have substantially taught in my lectures for more than twenty years.

When hemorrhoids are developed during the later

periods of pregnancy, the indications are obviously to counteract the constipation or the diarrhœa, and to stimulate and restore the tonicity of the hemorrhoidal veins. The inquiry will then naturally suggest itself, have we any agent, or combination of agents, in the materia medica, capable of effecting these results? I know of no article which so clearly and positively produces these two results as aloes, and on this I have mainly relied. I am well aware that the general voice of the profession is against the use of aloes where there is any tendency to hemorrhoids. That "aloes is contra-indicated by hemorrhoids" is not only the doctrine of the "Dispensatory of the United States" (Wood and Bache), but it has also been the opinion of most writers on this subject, from ancient times down to the present. It is stated in Stillé's "Therapeutics and Materia Medica" that "Fuchsius was of opinion, that of one hundred persons who should take aloes frequently as a laxative, ninety would be attacked with the piles. Murray blames physicians who are induced by the gentle and certain action of this medicine to expose their patients to so serious a consequence. It was to this purgative that Fonseca attributed the prevalence of piles among the inhabitants of Padua; and Stahl makes a similar statement in regard to the people of Hamburg. Calvin is cited as a prominent example of this mischief produced by aloes, for this celebrated reformer is said to have died ultimately from the effect of the piles which it gave rise to, but, as he was of a frail constitution, subject to quartan ague, gout, and gravel, the part which aloes bore in his demise may reasonably be judged to have been small."

These opinions have not been accepted by all; for Cullen, Sir Benjamin Brodie, Trousseau and Pidoux,

and others, have doubted whether aloes is productive of piles, and attribute this infirmity, not to the medicine, but to the constipation which aloes is used to remove. I will, however, say that, from my own observation, I am convinced that aloes will, under certain conditions of the system and in certain doses, develop piles. The special property of aloes is "to excite the muscular contractility of the colon and rectum," and "to stimulate the venous system of the abdomen, and especially of the pelvis." That these are the effects of this agent, I not only have the authority of special writers on therapeutics, as Pereira, Wood and Bache, and others, but I believe the general experience of the profession will also confirm the assertion.

It would seem, therefore, that the use of aloes for the cure of hemorrhoids in pregnant women would have been suggested by *a priori* reasoning, but I am not aware, from any thing that I have read, that it ever has been. I suppose that the general impression that aloes is contra-indicated where there is any tendency to piles, and that it possesses emmenagogue properties, has had great influence in preventing this. In my own case, the use of aloes for this purpose was the result of gradually-accumulating observation rather than from any reasoning on the subject. In the early days of my professional life, I was engaged to attend a woman in her confinement, who suffered from obstinate constipation. I prescribed for her the Dewees pills, in which aloes is one of the most prominent articles. At the time of her confinement, she mentioned that in her former pregnancies she had suffered very much from piles, but that my pills had cured them. If I had known of her hemorrhoidal tendency, I should not have given these pills, and I was, therefore, quite sur-

prised by her statement, as the result seemed so contrary to all that I had been taught. From this time I began to experiment as to the effect of aloes in the treatment of hemorrhoids associated with constipation in pregnant women, and for many years past I have constantly made use of this drug for their cure, whether the hemorrhoids were the result of constipation or of diarrhœa. I give it, combined with other agents, and in such doses as I learn by a knowledge of the peculiar idiosyncrasy of the individual to be necessary to secure one easy, free, daily evacuation of the rectum. Some require a grain morning and evening, while in others, a half-grain is sufficient. In anæmic patients, I combine aloes with the sulphate of iron. The following is a frequent prescription with me:

℞. Pulv. aloes soc.,
Sapo. Cast., āā ʒj.
Ext. hyoscyami, ʒss.
Pulv. ipecacuanhæ, gr. v.
M. Ft. pil. (argent.), No. 20.
S. One morning and evening.

When the patient is anæmic, I add to the above one scruple of the sulphate of iron.

When the hemorrhoids are associated with an irritable rectum, and with frequent small, teasing, thin evacuations, I substitute for the hyoscyamus a small quantity of opium, giving also a less quantity of the aloes, as in the following formula:

℞. Ferri sulphat, ʒj.
Pulv. aloes soc.,
Ext. opii aq.,
Sapo. Cast., } āā gr. x.
M. Ft. pil., No. 20.
S. One morning and evening.

It is unnecessary for me to multiply formulæ, as the

general principles by which I am guided will be sufficiently evident from what I have already said.

In some cases I have not been consulted, and have not known of the hemorrhoidal tendency of the patient until my attendance during labor, when the hemorrhoidal tumors sometimes become very large. Dewees says: "Much may be done during labor to prevent a severe spell of piles by the accoucheur making a firm pressure upon the verge of the anus with the palm of his hand, guarded by a diaper, during the progress of the head through the external parts, and by carefully returning them after the expulsion of the placenta, as the sphincter is now fatigued, and will not oppose their descent."

I have frequently tried this experiment, but cannot say that it has been very successful, as the tumors soon came down again, and under these circumstances they are very apt to become strangulated, inflamed, and cause a great deal of suffering. When this condition of things exists, I have, within a few years past, adopted the plan of forcible dilatation recommended by my friend and colleague Professor Van Buren. My method is this: the patient being fully under the influence of chloroform, I select the moment after the delivery of the child, and before the placenta is brought away. I push back the tumors within the sphincter, if this can be done readily; if not, I leave them alone, and introduce both thumbs, back to back, well in the sphincter, and then, opening them as widely as possible, I draw them through the sphincter, thus forcibly dilating, and perhaps tearing, the fibres of this muscle. During this time firm pressure should be made on the uterus by an assistant. In several instances the operation has been followed by the sudden expulsion of the placenta from

the vagina. I then direct the following ointment to be applied to the tumors, and well up the rectum, twice daily:

℞. Ung. gallæ co.,	℥ j.
Ext. opii aq.,	ʒ j.
Sol. ferri persulph.,	ʒ j.

M. Ft. ung.

The result of this procedure has been, in every instance, that the tumors have rapidly disappeared; and the patients have had very little suffering from the operation.

When hemorrhoids come on after labor, the suffering is generally much greater than when they occur during pregnancy. They are very often brought out by the action of the purgative, given two or three days after confinement.

As I before remarked, I have for a long time been convinced that castor-oil is one of the worst agents that can be used as a laxative when there is a tendency to piles; and, in many instances, I have seen them developed by its action. For several years, I have spoken of this to the medical class before whom I have lectured, and I have received many letters from former students corroborating my statements by their own observation. But I have never seen this alluded to by writers, except in one work, that of McClintock and Hardy, "On Midwifery and Puerperal Diseases." They incidentally make the following remark: "We may first observe that castor-oil is ill suited for patients who have hemorrhoids, being very apt to produce in them tenesmus and considerable irritation of the rectum." I may add the following from Quain's work on "Diseases of the Rectum:" "Common opinion has assigned to castor-oil a character for blandness (probably because of its being an oil) to which it is not entitled. It is an efficient purgative; but, except when given in

minute quantities, it usually irritates the rectum." In Wood and Bache's "United States Dispensatory" (article, Castor-oil), we find the following sentence: "Some apothecaries are said to use it as a substitute for olive-oil in cerates and unguents, but the slightly-irritating properties of even the mildest castor-oil render it unfit for those preparations which are intended to allay irritation." It is curious that its irritating action on the mucous membrane of the rectum has not attracted more attention.

In those who have, or who are predisposed to have, hemorrhoids, I give the following on the second day after confinement:

℞. Magnesiæ sulph.,
Magnesiæ carb.,
Potass. sup. tart.,
Sulphur. sublim., } āā ʒ ss.

Mix thoroughly. S. From a teaspoonful to a tablespoonful of the powder in a wine-glass of sugar and water before eating in the morning.

This powder produces a soft evacuation, without pain, even when the hemorrhoids are inflamed. By procuring a daily evacuation with this powder, and the use of the ointment before mentioned, I have found the hemorrhoids in puerperal women soon cease to give trouble.

LECTURE III.

LACERATIONS OF THE PERINÆUM.

Reports of cases—It cannot always be prevented—Four varieties—Causes—Liable to occur from certain anatomical peculiarities; as from a sacrum of less curve than usual; from the direction of the vulval opening; from excess of adipose tissue in the perinæum; from extreme narrowness of the vulva; from disproportionate size of the head and shoulders; from certain peculiarities in the mechanism of labor; from some of the physiological phenomena of the labor; from unskillful or careless manual or instrumental delivery—What "support of the perinæum" really means—The forceps as a means of prevention—How anæsthetics may act in preventing this accident—Incision, when necessary—Method proposed by Dr. Goodell, of Philadelphia.

"CASE I.[1]—Primipara, aged twenty-six. The labor presented nothing unusual, the child, a female, weighing eight pounds and three-quarters, being born in about eight hours after labor commenced. The vertex presented in the right occipito-posterior position, and the occiput, instead of rotating under the pubes, passed into the hollow of the sacrum. The labor, however, progressed favorably, and the head soon appeared at the vulva. The perinæum was then carefully supported, and, as soon as the head was born, pressure was made on the uterus, and kept up during the delivery of the body of the child, and afterward, to secure permanent contraction of the uterus. The cord having been tied and cut, and the child removed, the perinæum was examined, and found to be lacerated to the extent of about an inch. It was noticed that there was some hemorrhage, but it was thought that it would cease on the removal of the placenta. This was easily accomplished in a few min-

[1] Cases reported by Chas. H. Suydam, M. D., house-physician to Bellevue Hospital.

utes; but, as the bleeding continued, particular attention was given to the uterus, upon which steady, firm pressure had been kept up from the time of the delivery of the child's head, and the uterus was found to be firmly contracted. Remembering then a case which I had seen some weeks before, in which, although the uterus was firmly contracted, severe hæmorrhage had occurred, and Professor Barker found that the bleeding was from lacerated vessels in the perinæum, I concluded that the present was a similar case. I therefore at once endeavored to arrest the hæmorrhage by sponging away the blood and clots, so as to discover the source of the bleeding, which, I should have stated, did not come on in a profuse and general flow, as if it were from several points at once, but in a steady, continuous jet, about as large as a small quill. I then passed two fingers into the vagina, and, with the thumb externally, I firmly compressed the lacerated edges of the perinæum. This attempt was not at first successful in arresting the hæmorrhage; but, after changing the position of my fingers several times, I succeeded in arresting any further flow; and, when, after an hour and a quarter's continuous pressure I gradually withdrew my hand from the vagina, it was not followed by any bleeding. Firm pressure was kept up by my assistant upon the uterus during the whole time, but it showed no disposition to relax. The patient's knees were then tied together, a full opiate was given, and she was directed to remain perfectly quiet, and a nurse was left by her side to enforce my directions, and to send at once for aid should the hemorrhage recur. It did not, however, and the patient made a very good recovery, adhesion taking place kindly. The amount of blood lost was estimated at rather more than a quart."

"Case II. occurred in a woman, aged twenty-six, who was delivered of her second child, after a labor lasting about nine hours. The child was a female, weighing nine pounds and three-quarters, the presentation, left occipito-anterior. There was, in this case, the same series of events as in the one just described—the firm pressure on the uterus after the delivery of the child's head, the permanent contraction of the uterus, and the rapid delivery of the placenta, and hemorrhage, continuing, notwithstanding that the uterus was well contracted. The amount of blood lost could not be accurately determined, but it was very considerable; and the veins of the labia and thighs, which were varicose, were decidedly less prominent when the hemorrhage was arrested than when it began. The bleeding was stopped by the same means as in the first case, and

the patient recovered well. The perinæum in this case, too, was supported during the passage of the child, but the laceration was not so extensive as in the former case.

"Case III. was in a primipara, aged thirty-three; the labor lasting ten hours; vertex presentation, left occipito-anterior position; the child, a girl, weighing seven and a quarter pounds. The case was in all respects similar to the last—there was hemorrhage from the lacerated vessels of the perinæum, which was arrested in the same way. This woman, too, recovered well.

"Case IV.—Primipara, aged seventeen; left occipito-anterior position; the labor lasting fourteen hours; the child, a male, weighing nine pounds. In this case, the perinæum was not supported, as the child was born when I was not with the patient, and the laceration was much more extensive, reaching to within half an inch of the anus. The hemorrhage, also, was much more severe than in the other cases, amounting, as it was judged, to nearly two quarts. Pressure, moreover, failed to arrest it, and it was only stopped, after it had continued some time, by packing the vagina with ice, and retaining it by a compress. As an illustration of the force of the flow, I may mention that, as I withdrew my hand, after finding pressure would not arrest it, probably because I could not succeed in finding the bleeding vessels, a jet of blood escaped with such force as to strike the patient's knee, she being on her back with the legs extended. The recovery of this patient was not so rapid as that of the others, probably owing chiefly to mental causes. Nothing serious, however, interrupted her convalescence, and she soon regained her natural color. In all the cases, the knees were tied together, the bowels were kept quiet by opium, and the lacerations united kindly."

Gentlemen: Laceration of the perinæum is an accident of parturition which has occurred in the practice of the best obstetricians, and cannot always be prevented; but I believe that a thorough appreciation of the conditions under which it is liable to happen, and a judicious and timely use of means appropriate to each special condition, to avert the danger, will render the accident a very rare one. We have no statistics from which we can learn either its comparative frequency, or the success of

any measure in preventing its occurrence. There is no doubt that the anterior border of the perinæum, or fourchette, is generally lacerated in primipara. The late Dr. Williams, of Manhattanville, who was obstetric physician to the Emigrants' Hospital, Ward's Island, asserted that a visual examination would show that, in first labors, the mucous fold, called the fourchette, was always lacerated; and, to satisfy myself on this point, I went with him to Ward's Island, on three different occasions. We carefully inspected these parts in sixty-two primiparæ, and I must say that, in every one, this mucous fold was found to be torn, but, in thirty-seven, there was no laceration of the other tissues of the perinæum.

If we study the anatomical structure of the perinæum, and recall the enormous distention to which it is subjected during the last stage of labor, we can but wonder why serious laceration of its tissues does not occur more frequently. The perinæum is the space between the anus and the lower border of the vulva, and consists of skin, fascia, adipose tissue, nerves, blood-vessels, and muscular fibre. The muscles found here are: the constrictor vaginæ, the sphincter ani, the ischio-cavernosus, and the transversalis perinei, all of which meet and have a common insertion at the centre of the perinæum. The length of the perinæum is ordinarily from an inch to an inch and a quarter or an inch and a half, but its tissues are so distensible that, when put on a stretch during labor, it will frequently measure from four to five inches. After parturition, it is some ten or twelve days before it contracts to its normal length. This should be remembered, for reasons which I shall allude to hereafter.

Mr. Baker Brown, in his work on the surgical diseases of women, divides laceration of the perinæum

into four varieties: 1. That in which the perinæum is torn to the extent of an inch or less from the fourchette. This degree of injury is of no great moment, is little marked when the parts return to their normal state, and requires no special treatment. 2. Where the perinæum is torn between the constrictor vaginæ and sphincter ani, those muscles remaining intact. This is actually a perforation, and quite a number of cases have been published in which the child has been delivered through this accidental opening. 3. Where the laceration occupies the entire length of the perinæum, but does not involve the sphincter ani. 4. Where it extends so as to divide the sphincter ani, and even the recto-vaginal septum. In one case that I saw, there was laceration of the recto-vaginal septum, and at least some of the fibres of the sphincter ani, while the remaining anterior portion of the perinæum was preserved. In November, 1857, I was called in consultation by a physician of this city, to see a lady twenty-one years of age, who had been in labor with her first child twenty-six hours. I found the perinæum enormously distended by the pressure of the head, and the left hand and forearm projecting through the anus. The doctor informed me that the head had been pressing on the perinæum for some hours, and the pains were so regular and so violent that, with each pain, he had confidently looked for the exit of the head from the vulva. But just before sending for me, the hand and arm suddenly appeared through the anus, after which the pains had ceased. After some consultation, it was decided that we should not attempt to replace the arm, but leave it alone, and that I should attempt to deliver the head by the forceps. With great care, I succeeded in doing this with very moderate traction, the handles of the forceps being directed upward

at an acute angle from the plane of the abdomen of the mother. For some ten days, the bowels of this patient were kept closed by opium, and complete cicatrization followed, the only interruption to normal convalescence being that the catheter was required to empty the bladder for nearly three weeks.

It is the province of the obstetrician much more frequently to prevent this accident than to cure the patient after it has occurred. To be able successfully and skillfully to do this, it is absolutely essential that the conditions which are likely to produce it should be thoroughly appreciated. We may, perhaps, give a more clear conception of these conditions by classifying them as follows:

1. Certain anatomical conformations of the maternal organization are peculiarly liable to this accident, as (*a*) a very straight sacrum. Now and then you will meet with a woman in whom the sacrum has little if any more curvature than is ordinarily found in the sacrum of the male. This is the case with the woman whom I have shown you in the wards, with complete procidentia uteri. The perinæum was lacerated in a labor some years ago, and the posterior border of the vulval opening is not three lines from the anus, and on examination we found that the sacrum was remarkably straight. In such a pelvis, the effect of the uterine contractions is to drive the head directly down upon the perinæum in a line nearly parallel with the axis of the superior strait. (*b.*) The direction of the vulval opening differs very greatly in different women. I am not aware that any author has alluded to this, but your own future experience will surely verify the truth of the assertion. In some, the ostium vaginæ is nearly parallel with the plane of the trunk, while in others, it.

is nearly at right angles with this plane, or, to put the statement in other words, in some, the direction of the vaginal canal is nearly parallel with the axis of the pelvic cavity, while in others, it more nearly corresponds with the axis of the outlet. This difference does not depend entirely, as you may at first suppose, upon the length of the perinæum, nor upon the straightness or curvature of the sacrum, but a careful study of the subject has led me to the belief that it is due more to the conformation of the soft structures within the pelvic cavity. You can readily understand how rupture or laceration of the perinæum is much more liable to occur, where one condition exists, than where the other is present. You can also see the bearing of this anatomical fact, if you admit it to be an anatomical fact, upon the necessity in some cases, and the proper mode in different cases, of supporting the perinæum. (*c.*) There is a great difference in women in the elasticity and distensibility of the perinæum, depending partly upon the amount of adipose tissue in its structure. Where this is very considerable, there is sure to be an unyielding perinæum. (*d.*) Laceration is liable to occur when there is extreme smallness of the vulva. According to Velpeau, its mean size from the clitoris to the posterior commissure is one inch and a half. In some cases, exceptional ones to be sure, that I have had, I am sure that the measurement between these two points could not have exceeded three-fourths of an inch. There is a prevalent notion, even among medical men, that the size of the vulva corresponds with the size of the mouth, but I am convinced that the opinion has no foundation in fact.

2. The perinæum is liable to laceration from the excessive size of the head or the shoulders of the

fœtus. This excess may be absolute, as in one case that several of you saw me deliver by forceps in this hospital, where the occipito-mental diameter of the fœtal head was six and five-eighths inches, one and one-eighth of an inch beyond the ordinary normal measurement. In another case, where there was no excess in the size of the head, I found great difficulty in delivering the shoulders, and, on measurement, the bis-acromial diameter proved to be six inches and three-quarters. The excess may only be relative as compared with the size of the vulva.

3. Laceration of the perinæum is often liable to occur from certain peculiarities in the mechanism of labor, as: (*a.*) In vertex-presentations, where the occiput rotates backward into the hollow of the sacrum, because here an occipito-frontal diameter must first pass out of the vulva, which is three-fourths of an inch greater than the sub-occipito-bregmatic diameter, which ordinarily first passes out, in occipito-anterior deliveries. (*b.*) In face-presentations, because, during delivery, the vulval orifice must be distended to the length of the longest diameter of the fœtal head; that is, the occipito-mental diameter, which is ordinarily five and one-quarter inches. (*c.*) Incomplete flexion, when the head presses upon the perinæum, may also be a cause of great danger of this accident, as in this case the occiput does not fully engage under the arch of the pubes, and thus the occipito-frontal, instead of the sub-occipito-bregmatic diameter, will first be driven through the vulval orifice. (*d.*) On the other hand, excessive flexion may also tend to this result, as the direction of the expulsive force of the uterus, falling nearer the occipital half of the occipito-frontal diameter, will be an obstacle to the extension of the

head, which takes place in its normal exit through the vulva.

4. The physiological character of the labor is an important element as regards the danger of this accident: (*a.*) When the labor is too rapid, from the intensity and frequency of the uterine contractions, and especially if the sacrum be somewhat less curved than is usual, the head may be driven through the vulva before the perinæum has had time to be gradually extended. (*b.*) Or, where the labor is very tedious, and the head remains a long time at the lower strait, until the perinæum becomes hot, dry, congested, and unyielding, if a rapid delivery be effected, either by means of ergot or the unskillful use of the forceps, the sudden expansion of this tissue is very apt to involve a more or less extensive laceration. (*c.*) Excessive nervous irritability, causing the patient to make most violent straining efforts to force the head through the vulva before the perinæum is prepared for it by a gradual expansion. My house-staff have repeatedly mentioned cases to me, occurring in the hospital, where patients have suddenly withdrawn themselves during a violent pain, and thus the perinæum, being deprived of all support, is lacerated to a greater or less extent. I am confident that a majority of the cases of laceration that have come under my observation here have occurred in this way, if I can accept the testimony of my assistants, which I certainly do.

5. I must not omit to mention unskillful or careless manual or instrumental delivery as a cause of laceration of the perinæum. I shall here only allude to this fact, as a full discussion of this point necessarily pertains to your instruction on manual and instrumental labor.

Now the practical question comes up; what means have you for preventing this accident from the various causes which I have mentioned? Until quite recently, nearly all the standard works on obstetrics have taught that to "support the perinæum" was an absolute duty, in all cases, never to be neglected. The reasons which have been urged for this have been wonderfully diverse and contradictory. But, within a few years past, this subject has been studied anew, and most ably reviewed, more prominently by Professors Leishman, of Glasgow, and Graily Hewitt, of London, and Dr. Wm. Goodell, of Philadelphia. In the number for January, 1871, of the *American Journal of the Medical Sciences*, Dr. Goodell has an article on this subject, which is very remarkable for its historical and learned research, its analysis and condensed summary of the teaching of past authorities, and its novel suggestions. Were I to thoroughly go over this whole ground, it would occupy more time than I have for this subject, if I am to give the due relative proportion to the other topics which I must discuss with you. I can therefore only give you my conclusions, or, rather, tell you what principles govern me as to this matter.

Now, let me say that, in many cases, just that kind of assistance, which is called "support of the perinæum," is of great service. The remark of Denman, so often quoted, that, "when women were delivered without assistance, I have not, in any case, observed any considerable laceration," is quite opposed to my experience. Two of the most severe lacerations that I have ever seen were in women who were brought into this hospital, one of whom was delivered in the street, and the other in the police station-house. An instructive incident occurred to a teacher of midwifery

in this city, while lecturing on this accident to a class of medical students by the bedside of a woman in the last stage of labor. He said that "he had never known a case of severe laceration of the perinæum, except where it had been *well supported*." His experience was then and there somewhat enlarged, for, while he was yet talking, the woman had a severe pain, by which the head was delivered, and it was found that the perinæum was torn down to the sphincter ani. I agree that the term "support of the perinæum" is an unfortunate one, because it conveys a wrong impression as to the kind of assistance rendered, when the hand is applied to the perinæum, as authors direct, during the last stage of labor. I believe that this often materially facilitates the mechanism of the labor, when intelligently done, by aiding extension of the head in occipito-anterior positions, and flexion of the head in occipito-posterior positions. It is thus that this application of the hand protects the perinæum. I think, also, that this application of the hand to the perinæum may be made most useful, in some cases, in directing the force of the uterus from the perinæum toward the vulva, and, in others, in counteracting the too violent efforts of the uterus.

From what I have already said, it will be inferred that the danger of laceration is to be met by special means adapted to each particular condition, and that, for an obstetrician to be competent to successfully avert this danger, he must be thoroughly familiar with the mechanism of labor. He will then understand how the improper or maladroit use of the forceps may, in some cases, cause this accident; while in occipito-posterior deliveries, in some face-presentations, and in those cases of vertex-presentation where there is excessive

flexion of the head, and the sacrum has a less curvature than is normal, the use of the forceps may be absolutely necessary to prevent laceration.

Anæsthetic agents are another important means of great value in preventing this accident. They are indicated, for this purpose, in four classes of cases: 1. In that form of rigidity of the perinæum depending upon excessive irritability of the muscular fibres that enter into its composition. I have repeatedly been struck with the rapidity with which relaxation and dilatation of the perinæum, under these circumstances, have followed the inhalation of chloroform. 2. In those cases where the danger arises from the violent and rapid uterine contractions, driving the head or the shoulders through the vulva before the perinæum has been sufficiently expanded. I have frequently, just as the labor was terminating, pushed the chloroform to the extent of carrying the patient into the state of profound anæsthesia, for no other reason than to protect the perinæum. 3. Paradoxical as it may appear, after what I have just said, an anæsthetic is often indicated to protect the perinæum in tedious labors. Long-continued pressure of the head may produce congestion and inflammation of the perinæum, which not only renders it more unyielding, but more easily torn. It becomes hot and dry, and very painful, and uterine action becomes irregular and feeble, in consequence of this condition. Now, under these circumstances, I have seen the inhalation of chloroform followed by immediate relaxation of the perinæum, and a restoration of the normal moisture and temperature of the parts, while efficient action of the uterus was at once resumed.

When the vulval orifice is excessively small, or when the amount of adipose tissue in the perinæum is

too great to admit of its necessary expansion, I think that our only resource against the accident of laceration is a small incision of the lateral superior portions of the perinæum. An incised wound heals much more rapidly than a lacerated one. It affords an opportunity for election as to the point where the lesion shall occur, and thus the obstacles which prevent immediate adhesive union may be more effectually guarded against, and experience seems to prove that an incision of two or three lines on each side is sufficient to prevent laceration in the median line, the extent and result of which cannot be foretold. So I perform this operation, on the ground that we thus select the lesser to prevent the greater evil, and, in several instances, I have done this with most favorable results in all respects.

Dr. Goodell, in the paper which I have alluded to before, suggests a new method of managing the perinæum to prevent its laceration. I shall give his suggestion in his own words: "Whenever, therefore, it seems proper to aid Nature, insert one or two fingers of the left hand into the rectum, the woman lying on her left side, with the knees well drawn up and separated by a pillow, and hook up and pull forward the sphincter ani toward the pubes. The thumb of the same hand is then to be placed upon the fœtal head, scrupulously avoiding all contact with the fourchette. The right hand need not remain idle; it assists the thumb in making the head hug the pubes, or in retarding its advance; after a pain, it presses back the head from the perinæum, and thus represses reflex uterine action; it restrains the movements of the woman; it pushes up the corrugated scalp, so that no folds shall remain beneath the sharp edge of the perinæum to increase the

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circumference of the child's head; finally, it supports the emerging head and body, causing them to describe the curve of Carus." He claims for this method the following advantages: "1. By pulling up the sphincter ani toward the pubes, not only is Nature imitated, which always dilates the anal orifice, but the perinæum is brought forward without direct pressure, and the dilatation is diffused over its entire surface, causing a corresponding relaxation of the strain on the posterior commissure in the line of its raphe. In addition, its muscular fibres are crowded up to, and consequently strengthen the line of greatest tension, just as a prudent general hurries up reënforcements to the point of attack. 2. The same force which dilates the sphincter ani compels the occiput to hug the pubes and favors extension, especially if the fingers in the rectum be hooked over the prominences of the fœtal face, or over the chin. 3. This aid is not liable to sudden interruption, for, however restless the woman may be, the thumb and fingers, once well applied, follow her movements without relaxing their hold. 4. The thumb of the left hand, together with the fingers of the right, can, by direct pressure upon the presenting part, restrain its too rapid advance, without exciting reflex uterine contraction. 5. The circulation of the blood is left free, the nerves are not benumbed by pressure, and the perinæum therefore continues in its normal condition—that of a living, elastic, and sentient tissue. 6. After the parts attain their maximum dilatation at the occipito-bregmatic circumference of the fœtal head, it is, in my experience, as well as in that of Sacombe, the rapid springing back of the fourchette over the projecting nose, or the rapid expulsion of the shoulders, that often produces lacerations. These causes are, however,

well controlled by my method, in the former instance, by merely pulling forward the sphincter ani; in the latter, by adding the support of the right hand to the emerging shoulders."

The method suggested by Dr. Goodell strikes me as eminently sensible, and his reasoning in support of the plan is most sound and forcible. But I have not yet had the opportunity of testing his views by a sufficient number of cases to speak with a practical experience in regard to its value. As my practice is to deliver the woman lying on her back whenever danger is threatened to the perinæum, I should be obliged to effect the result by a somewhat different manipulation, but the end would be practically the same—that is, to carry forward the perinæum toward the pubes "by hooking the fingers into the rectum." In one case of forceps-delivery, where the danger to the perinæum was imminent, I practically carried out the suggestions of Dr. Goodell by the fingers of an assistant, and I was delighted with the result. It is not my province to speak of the surgical treatment of this accident, as that you will have taught and admirably illustrated by my colleagues, Professors Taylor and Lusk.

LECTURE IV.

THROMBUS OF THE VULVA AND VAGINA.

Case—Frequency of occurrence—Causes—During gestation—During labor—After Delivery—Anatomical seats of the extravasation—Symptoms—Diagnosis—Fatality to mother and child from this cause—Causes of death—Treatment.

"Case V.[1]—Margaret ——, aged nineteen, New York, primipara. Labor-pains began about 12 o'clock, the night of January 15th, and continued, with only slight intensity, all the next day. At 5 P. M. (January 16th) the bag of waters broke, and the patient was immediately sent to the lying-in ward.

"On examination, no deformity of the pelvis or of the soft parts was found; the cervix was soft, moist, and dilatable, the os being an inch and a half in diameter. The vertex was presenting in the left occipito-anterior position. Fœtal heart heard on the left side below the umbilicus, 130 per minute. At 7.30 P. M. the cervix was fully dilated, and the uterine pains continued good and regular. In a short time, the head descended to the inferior strait, and remained there till 11.10 P. M. The woman seemed to suffer a good deal of pain, and could not be made to bear down.

"While making an examination at this time, I noticed that the right labium majus was more swollen than at the previous examination, and that it was rapidly enlarging. I immediately supposed that I had to deal with a thrombus of the vulva, and endeavored, by moderate and equable pressure, and the application of ice, to prevent its increase. The patient says she never noticed any tumor about the vulva during pregnancy, nor had she received any injury in that situation.

[1] Reported by Alexander C. Graham, M. D., house-surgeon to Bellevue Hospital.

"In twenty minutes, the thrombus was as large as the fist, its mucous surface being purple; and the patient was suffering intensely. The labor-pains now ceased—the head being at the inferior strait, not yet having distended the perinæum. While making preparations to incise the tumor, its coverings broke, and profuse hemorrhage of an arterial character followed. The opening at the border of the mucous membrane was enlarged by incision; the clots turned out; and the cavity, three inches in depth, filled with a piece of ice. The head was not far enough down to make compression, and efforts to make the labor advance were unavailing. The hemorrhage still continuing, the cavity was tamponed with pieces of sponge soaked in the liquor ferri persulphatis; this, with firm compression made by the hand, arrested the flow of blood.

"An ounce of urine was now drawn from the bladder, and, on ausculation, the fœtal heart was found to be pulsating. Dr. Barker was sent for, and, at twenty minutes after 12 o'clock, the patient being under chloroform, applied the short forceps. The child, weighing seven pounds and three-quarters, was born at half-past twelve. The placenta came away in a few minutes. The hemorrhage was now frightful—a perfect stream of blood, of a bright-red color, falling into the vessel at the foot of the bed. The opening was again enlarged by incision, and the cavity of the thrombus tightly plugged with pieces of cotton, soaked in liq. ferri persulphatis. The bleeding now ceased; but the pulse had become imperceptible, and the face was intensely pale. Two drachms of U. S. sol. morphiæ sulphatis, in an ounce of whiskey, were immediately given, and repeated in half an hour. After the first dose, the pulse was 165, very small and weak. At 3.30 A. M., it was 120, and fuller. As much beef-tea as the patient would take was given, and she soon fell asleep.

"At 10 A. M., January 17th, there had been no return of the hemorrhage. The vulva was gently washed with warm water containing liq. sodæ chlorinatæ, great care being taken not to disturb the large clot. The urine was drawn off, and the parts were covered with a piece of lint, soaked in carbolic acid and glycerine (1 to 20). Ordered the vagina to be thoroughly syringed, several times daily, with water containing the liq. sodæ chlorinatæ; two grains of quinine and one-half grain of opium every six hours; stimulants and a nutritious diet.

"January 18th, 10 A. M., pulse 92; respiration 18; temperature

100°. The same treatment to be continued. There was no sloughing about the wound. While washing the vulva, part of the clot came away, but there was no bleeding. At 7 P. M., pulse 120; respiration 21. This afternoon, a poultice was applied to the vulva, and to-night the patient passed her water. Her bowels are confined; the lochia are free.

"*January 26th.*—The patient has steadily improved, without an unfavorable symptom. Her bowels were moved, several days after her confinement, with a laxative. The wound has cleaned off and is granulating nicely. Ordered iron and quinine. The tumor has now almost entirely subsided, with but slight suppuration, and no sloughing whatever. The parts have been kept scrupulously clean by a wash of chlorinated soda. All excoriation, or irritation from the passage of urine, has been prevented by the use of the catheter, and by having the parts covered with a solution of carbolic acid in glycerine. Her recovery was rapid and complete."

This accident is one which may occur during the later periods of gestation, or as a complication of labor, or it may not become manifest until after the labor has terminated. It is not of frequent occurrence; but you may meet with it, as I did, in the very beginning of your professional life. We have had two cases in this hospital within the last two months. Johnston and Sinclair report seven cases during their seven years' service as assistant physicians in the Dublin Lying-in Hospital, two of which died. Scanzoni met with fifteen cases—the tumor occurring in eight cases before the expulsion of the child, six times during the delivery of the placenta, and once, in a twin case, between the birth of the first and second child. Death occurred in but one of Scanzoni's cases. In a French monograph on this subject, by Deneux, published in Paris in 1830, he gives sixty-two cases of thrombus of the labia, occurring before, during, and after labor; and, out of this number, twenty-two of the women died, and twenty-one of the children were lost. But Deneux himself, in

fourteen years' practice, met with but three cases; and the late Baron Dubois saw but three in fourteen thousand labors. Two cases have occurred in the practice of my colleague, Professor Sayre, in one year; and Professor Wood has seen one, in consultation, in the same period.

During pregnancy, the most frequent cause of this accident is undoubtedly some local violence; but some cases have been reported where the thrombus seems to have been brought on by emotional causes alone. The pressure of the gravid uterus so interferes with the return of the venous blood, as frequently to cause œdema of the lower extremities, and often a varicose condition of not only the veins of the lower extremities, but also of the vulva and vagina, and of the other parts contained in the pelvic cavity. But this condition does not seem to predispose especially to thrombus, as, in a very large majority of the cases of thrombus, no such antecedent condition has been found.

During labor, this accident may be generally referred to the prolonged delay of the head in the pelvic cavity from any cause whatever. When it occurs after delivery, it is very obvious that the determining cause of the lesion must have been effective before or during labor.

The anatomical seat of this lesion is very much more frequently in the extended labia than anywhere else, generally in one labium alone, but in both sometimes. But the effusion is often vaginal—that is to say, in the pelvic cavity. It is only in very exceptional cases that the thrombus occurs in both sides of the vagina at the same time. In a thesis by Perret, formerly an *interne* at the *Maternité*, Paris, it is stated that the most common variety of vaginal thrombus is where the tumor ex-

tends toward the vulva (strictly speaking, a vulvo-vaginal thrombus), which occurred sixteen times in forty-three cases. The extension of the tumor toward the abdomen occurred seven times, while it extended both toward the vulva and the abdomen but three times in forty-three cases. I should have before remarked that, in labial thrombus, the effusion in some cases extends to the perinæum, either penetrating the superficial cellular tissues of this part in all directions, or passing more profoundly to the iliac fossa laterally, or posteriorly to the sacrum, and even to the lumbar region. So, also, in the vaginal thrombus, the infiltration of blood may extend to the adjacent parts, into the areolar tissue of the broad ligament, or the sub-peritoneal areolar tissue of the abdomen. Cazeaux published one case where the autopsy revealed this result; and Perret reports a case at the *Maternité*, where, by the post-mortem examination, a large sanguineous tumor was found filling the left lateral half of the pelvic cavity, and the infiltration of blood had extended into the sub-peritoneal cellular tissue of the abdomen.

Thrombus of the vulva and vagina, being always consequent upon a traumatic lesion, has no prodromic symptoms; but there are symptoms which indicate the presence of the sanguineous tumor. The formation of the thrombus is generally preceded by a few moments of very severe, acute, lancinating pains, quite different in character from labor-pains. These pains are generally seated in the vulva or vagina, but they are rarely confined to these limits, radiating often to the legs, or back to the loins. Deneux asserts that pain is never absent; but other authors have specially mentioned the fact that in some cases this symptom has been *absent;* and in one case, which I saw in consultation with

Dr. Davis, although the distention of the labia was very great, the patient absolutely declared that she had suffered no pain in the part. But all evidence shows that such exemption from the characteristic pains is quite exceptional. These pains are due to the severe compression of the nerves involved in the tumefaction, and, from the same cause, we have in some patients the sensation of a thousand pins piercing the internal parts of the thighs, or of cramps in the legs. Every movement, especially of the lower extremities, greatly aggravates these symptoms. The formation of the thrombus takes place very rapidly after these symptoms have made their appearance. When the seat of the thrombus is in the vulva, the rapidity of the swelling, and inspection of the parts, will at once clear up the question as to the nature of the trouble. But, when the tumefaction is within the cavity of the pelvis, a vaginal and rectal examination becomes necessary, in order to acquire a precise idea of the character of the tumor, its seat, and its limits.

No doubt the many errors in diagnosis which we read of in practice must have arisen from ignorance of the fact that such an accident is liable to occur. For it would seem that the characteristic symptoms which I have mentioned, in connection with a careful physical examination, which at the present day can be made with the patient completely anæsthetized, should render the diagnosis of thrombus comparatively easy. It can readily be conceived that a small thrombus may give rise to no local symptoms, and that its existence may therefore be overlooked. If the tumor be intra-pelvic and large, and the examination be made while the extravasated blood has simply infiltrated the cellular tissue and not yet lacerated it, the tumor will seem hard,

feeling very much like the fœtal head covered with the tumefied scalp. Perret asserts that an examination of all the published cases shows that no example exists in science where the thrombus has been mistaken for some part of the fœtus. But, within my personal observation, it was once mistaken for the fœtal head, and, in another case, for placenta prævia.

You naturally ask, how these cases of thrombus end. The answer is, that, in some cases, a rupture of the sanguineous tumor occurs, the contents are discharged, the walls of the cyst adhere, and cicatrize within a few days—a week or less. In a small number, the rupture produces a fatal hemorrhage. But the thrombus may end in resolution, suppuration, or gangrene. The most rare termination is by resolution, as Perret found this result only four times in forty-four cases. It may, however, be hoped for, when the tumor is very small, and when it is unaccompanied by laceration, or in which the effusion has taken place without any severe injury of the cellular tissue. The tumor may suppurate, whether it be ruptured or opened by incision, and even in some cases when its cyst remains closed. Thrombus may also terminate in gangrene; and there is decided danger of this when the patient is exposed to the endemic influence of septicæmia or of puerperal fever.

The historical records of this lesion would seem to prove that the prognosis must be very unfavorable. I have already referred to the monograph of Deneux, in which it is stated that death resulted in twenty-two out of sixty-two cases, and, in twenty-one cases, the child was lost. Blot has collected nineteen cases, published since 1830, when Deneux's essay was printed, and in these nineteen, there were five deaths. In an

analysis of forty-three cases, by Perret, there were seventeen deaths, and one other probably terminated fatally. But I venture to say that, at the present day, the cause and character of the lesion are now so much better understood than in former times, and consequently the appropriate treatment is so much more promptly adopted, that the ratio of fatality has been greatly diminished. In fifteen cases, Scanzoni lost but one, and this patient died from puerperal fever. Two cases have occurred in my wards this winter, both of which recovered. The cases that I have referred to as occurring in the practice of Professor Sayre, and of Professor Wood, recovered. The whole number of cases that have occurred in my service in this hospital is thirteen, of which two died, both from puerperal fever, which, at the time, was endemic in the hospital. In private and consultation practice, I have seen nine cases, and I believe that every one of these cases recovered.

The deaths following thrombus have been ascribed to the following causes: Hemorrhage, external or internal; peritonitis; suppuration, with hectic fever; gangrene; pyæmia; septicæmia; and puerperal fever.

In discussing the treatment of this lesion, I shall restrict my remarks to cases occurring during and after labor, as those which happen during gestation hardly come within the scope of my present course. Besides, in Caseaux's "Midwifery" you will find the directions given for the management of those cases belonging to the time of gestation, so full and so excellent, that I should have nothing of value to add. Neither shall I have any thing to say in regard to the prophylaxis of this lesion, for I know of no preventive treatment which would promise any thing as a safeguard against this accident.

Many suggestions have been made, having this end in view, and particularly by those writers who have believed that the accident is almost always a consequence of varicose veins. I have already said that this belief seems to be erroneous. I could give you some reasons for the opinion, that a varicose condition of the blood-vessels of the vulva and vagina is a prophylactic against this accident; but I shall content myself with saying that I have seen many cases where this condition has existed, and, in none of them, was it followed by thrombus; and that, in all cases of thrombus that I have seen, it has not been known that the accident was preceded by a varicose condition of the vessels involved.

In now detailing to you the treatment which I shall recommend, where the thrombus is developed during labor, I must say to you that you will find other and different plans of treatment proposed by high authorities; but I shall give you my reasons for the mode of practice which I suggest, and you must subsequently weigh, compare, and decide for yourselves. It is in this way only that you will become good practitioners, and not by accepting the simple dictum of any teacher or writer.

(1.) If the thrombal tumor be not so large as to cause great pain by its pressure on the adjacent tissues, or to interfere materially with the delivery, or if laceration and escape of blood almost immediately follow the development of the tumor, apply the forceps, and deliver at once. The exciting cause of the accident is the arrest of the venous circulation by the mechanical pressure of the presenting part of the fœtus. The sooner the pressure is removed, the sooner will the danger be over, and the less will be the injury to the

parts. At the moment of the delivery of the head, there is usually an excessive flow of blood. Be prepared to meet this great gush of blood with compresses of cotton-batting, saturated with the solution of the persulphate of iron, which you apply directly to the bleeding, and keep up pressure till the hemorrhage stops, which is usually in a few moments. During this time, watch that your assistant keeps up firm pressure on the uterus; then deliver the placenta as soon as the hemorrhage from the lacerated vessels is controlled; and, after this, again apply your compresses with the persulphate of iron; but pressure on the parts is ordinarily required only for a short time. Direct the nurse to watch vigilantly for some hours for hemorrhage, and give her specific directions to follow in case of its recurrence, if you find that she has intelligence enough to trust her with such responsibility. If not, stay with the patient yourself. Most authors—I think every one that I have consulted—direct that, under the circumstances just described, a tampon should be applied. I must say, and with the strongest conviction that I am right, that I consider this direction a very bad one. In the first place, there is no need of the tampon after once arresting the hemorrhage by the means that I have described. In the next place, if the vagina be tamponed, you have pressure upon the urethra and the other parts, which have just been subjected to pressure and contusion, and you have the lochial discharges retained and decomposing. The safety of the patient requires you to guard against every possible danger of abscesses, sloughing, and decomposition, whether of the lochial discharge or of the blood effused, as, at this time, the system is especially liable to septic poisoning. Next to hemorrhage, I think the greatest danger in these cases

is from septicæmia. Hence, you should freely use antiseptics. I was greatly struck with the fact that our distinguished countryman, Dewees, who, in his work on "Diseases of Females," gave a very clear description of this class of accidents more than a half-century since, recommended pyroligneous acid as an application in these cases of laceration, thus anticipating the antiseptic treatment by carbolic acid, which is now so much in vogue. We employed, in the cases you have seen, a lotion of carbolic acid and glycerine, not only as an antiseptic, but as a means of protecting the parts from excoriation by the irritating discharges of the urine and the lochia.

It is an important point in the subsequent dressing not to detach the coagulum formed by the persulphate. This presents a black, ugly-looking mass, which you are strongly tempted to clear away, but you must never remove any part of it, except such as is completely loosened, for fear of secondary hemorrhage. Still farther to guard against this event, the patient should not be allowed to evacuate the bladder spontaneously, but the catheter should be employed for several days. In the case that you have just seen, after the coagulum had become detached, the surface looked irritated, a poultice was applied for one day, and healthy granulations appeared. Formerly these cases were treated by bleeding, antiphlogistic medicines, and a spare diet. This case has been treated on directly opposite principles—that of restoring the exhausted vital powers as rapidly as possible, by opium, alcohol, quinine, iron, and the most nutritious diet.

(2.) When the tumor has attained such a size as to offer a mechanical obstacle to delivery, incise at once, remove all the clots that have formed, and then deliver

by the forceps. The longer the incision is postponed the greater will be the amount of extravasation, the greater the distention of the parts, and the more extensive the laceration of their areolar tissue. The subsequent management will be the same as in the condition just described.

(3.) When the thrombus does not appear until after delivery, incision should not be made, so long as the tumor is increasing in size; or, in other words, not until after the coagulum is formed which arrests the hemorrhage by pressure on the lacerated vessels. In these cases, there is no doubt that the rupture of the vessels has occurred during the labor, but the extravasation has been prevented by the pressure of the head. When the ruptured vessels are very small, the effusion takes place slowly, and the tumor may not be discovered or even formed for many hours after delivery. Now, although in some cases the tumor may be absorbed, yet, if it be of any considerable size, it seems to me that the danger from suppuration and from septicæmia is infinitely greater than the danger, with the styptics we now have at command, from hemorrhage following the incision; and, therefore, the safe course is to incise early, except when the tumor is high up in the pelvic cavity. Then, it may be a question to be carefully weighed and decided, after a due consideration of all the elements of the case. I trust, gentlemen, that you will be prepared for this emergency. Although somewhat rare, it may occur to any one of you; and while, in the past, it has been attended with a fearful fatality, both to the mother and child, I hope, in the future, a more enlightened practice may render it less dangerous.

LECTURE V.

PUERPERAL ALBUMINURIA.

Case—In a majority of cases of puerperal albuminuria, Bright's disease is not present—Meaning of the term—Albuminuria and uræmia not identical—The albumen of the urine in Bright's disease differs from the albumen of puerperal albuminuria—Granular casts not characteristic of any peculiar lesion of the kidney—Causes of puerperal albuminuria—Symptoms—Effect on gestation, parturition, and puerperal convalescence—Prognosis—Treatment.

"Case VI.[1]—October 13th; Mary ——, aged thirty-three, married, has had five living children and two miscarriages, one at five and the other at six and a half months. Entered the hospital, October 12th, pregnant for the eighth time. Last menstruated, January 25th. Patient very feeble. Pulse 120 when sitting up, 108 when in the recumbent posture. Face very much swollen, and of a leaden hue. Both upper and lower extremities highly œdematous, as well as both labia, which are enormously swollen. Tongue pale and flabby. Patient reports that she has suffered constantly from headache for two months, and began, at about the same time, to have specks before her eyes, and 'now her sight is very bad;' 'would not know the face of her own daughter.' For several weeks, has suffered much from nausea and vomiting, and, for some days, has been sick all the time, and can retain no food. She is very thirsty, but rejects liquids as soon as she drinks. Says her bowels are regular, but has had no movement for two days before entering the hospital. Desires to pass water quite often, but never more than a tablespoonful at a time. On auscultation with Camman's stethoscope, neither the sound of a fœtal heart nor a uterine souffle could be heard. A catheter was passed, and three and

[1] Case reported by the house-physician to the lying-in wards of Bellevue Hospital, who neglected to append his name to the report.

a half ounces of water were drawn off. Specific gravity of the urine not ascertained, but, on applying heat and nitric acid, more than one-half was coagulated. Directed that all the water she should pass be saved for examination. Ordered eight dry cups to be applied over each kidney, a sinapism to the epigastrium, and one drachm of pulverized compound jalap every second hour, until cathartic action.

"*October* 14*th*.—No action from the powders, but she has had frequent vomiting and constant nausea. Has slept none; intelligence very dull; has not passed water, nor felt any desire to. Pulse 130, and very feeble. Examined by Professor Barker, who drew off, by the catheter, less than one ounce of water. Dr. Barker ordered one-eighth of a grain of elaterium to be mixed with a little butter, and to be put into the mouth every half-hour until catharsis resulted. This was repeated five times, before any effect, except vomiting, followed. After the sixth dose, she began to have very profuse, watery discharges, number not known, but probably not less than twelve or fifteen during the night; she slept well, except when disturbed by the action of the bowels.

"*October* 15*th*.—Patient says she feels stronger and better. Has but little nausea, and much less headache. Has taken a pint of milk this morning. Dr. Barker ordered—

℞. Tinc. ferri chloridi,
Glycerini,
Syr. simp.,
Aq. puræ, } āā ℥ j.

M. S. A teaspoonful in sugar and water every third hour.

"*October* 16*th*.—Patient passed a good night. Pulse 108. Bowels moved yesterday four times—very watery discharges. She has passed six ounces of water, highly albuminous, containing quite a number of hyaline casts. She has taken beef-tea and two eggs. No nausea, and but little headache, but her sight is not at all improved. Labor came on at 6 P. M. First stage, three hours; second stage, half an hour. Rupture of membranes, followed by an enormous discharge of waters. Child, a female; had evidently been dead for some time; weighed six and a quarter pounds. Third stage, fifteen minutes. Placenta very small, and fatty degeneration very marked, as shown by the microscope. Patient did not lose an ounce of blood.

"*October* 17*th*.—Pulse 108. Patient very comfortable in every respect. No after-pains. Lochia very scanty.

. "*October* 18*th.*—Bowels moved freely without medicine. Has passed, during twenty-four hours, eighteen ounces of water, still highly albuminous, with numerous casts. Patient says she is hungry. Ordered to have all the beef-soup and milk alternately that she will take. The iron has been continued regularly, except during the night.

"*October* 19*th.*—Pulse 96. Breasts full and painful. Lochia stopped. Has passed forty-four ounces of water; albuminous deposit not more than one-eighth of the bulk. Œdema of face nearly gone; still some œdema of the legs and feet. By her request, a child is given her to nurse.

"*October* 29*th.*—Patient able to go up two flights of stairs to Dr. Barker's clinic. Urine abundant; entirely free from casts, with but a very small proportion of albumen. Patient's only trouble now is her impaired vision."

This woman, gentlemen, has been in the convalescing ward, and her appearance has so changed since I last saw her, one week ago, that I can hardly persuade myself that she is the same woman whose history you have just heard read. It is a typical case of puerperal albuminuria, a disease of which nothing was known in medical science little more than thirty years ago, but in regard to which every year adds something to our knowledge. We now know it to be one of the most frequent of all the puerperal diseases. It is sometimes so trivial that it gives rise to no disturbance of pregnancy or parturition, while in other instances it causes most alarming and dangerous symptoms in the pregnant, the parturient, and the puerperal woman. Puerperal albuminuria was first observed and studied in connection with eclampsia, until naturally it came to pass that it was regarded as essentially the cause of these convulsions. It is fully understood now, by all advanced men, that albuminuria has an immediate bearing on a great variety of pathological conditions other than convulsions—that it often exists, as in the

case before you, in its fullest development, without causing convulsions—that dangerous and fatal convulsions may occur when albuminuria is wholly absent—and, still farther, that the nervous perturbations which cause the convulsions may also be the cause of albuminuria, or even that the convulsions themselves may be the cause of albuminuria. In the present state of science, albuminuria is no longer believed to be a symptom of Bright's diseases only. In fact, it is probable that, in nineteen cases out of twenty of puerperal albuminuria, the structural lesions of the kidney, implied in the term Bright's diseases, do not exist.

Now, let us understand what is the meaning of the terms we use: By albuminuria, it is implied that, through the medium of the kidneys, the albumen is filtered off from the blood to a greater or less extent, and discharged from the system in the urine. When this occurs, it is believed, also, that the kidneys fail in some measure to depurate the blood by eliminating urea. Albuminuria and uræmia are not identical terms, as either condition may exist and the other be absent; but I suppose that albuminuria cannot be developed to any considerable extent without being accompanied by more or less uræmia.

Robin, in his recent work on the fluids of the body, has demonstrated that urinary albumen has not the same composition as the albumen of the blood, and that the albumen of Bright's disease differs essentially from that occurring in the temporary albuminuria of pregnancy, as can easily be shown by its chemical reactions. The albumen of the urine in Bright's disease, when brought in contact with the oxide of copper, assumes a beautiful reddish-violet color, and produces a more or less abundant flocculent black precipitate. Now, the urinary

albumen of pregnancy, when Bright's disease does not exist, while it coagulates readily by heat and nitric acid, does not exhibit any such reaction with the oxide of copper. So, also, Robin has demonstrated that granular casts are not characteristic of any particular morbid state or pathological change of structure of the kidneys.

The question then naturally arises, What are the causes of puerperal albuminuria? I regret to say that, at present, we cannot fully or satisfactorily answer this question. It is an accepted fact that, in a large number of cases, gestation develops a temporary albuminuria, which may disappear during or soon after puerperal convalescence. The phenomena pertaining to this condition are rarely manifested before the sixth month of pregnancy. Statistics seem to prove that it occurs more frequently in first than in subsequent pregnancies. These elementary facts would seem to make plausible the theory first suggested, many years ago, if I am not mistaken, by Dr. Cormack, that the albuminuria results from congestion of the venous circulation of the kidneys, caused by the pressure of the gravid uterus on the emulgent veins. But, while there is probably much truth in this theory of the mechanical cause of the albuminuria, it does not contain the whole truth; and it does not even include all of the mechanical causes.

The process of parturition sometimes interrupts the venous circulation to such an extent as to produce a temporary hyperæmia of the kidneys, and develop albuminuria which had not existed during gestation.

So, also, in many cases, where the most careful and repeated examinations of the urine, made during gestation, have failed to detect albumen, convulsions have occurred during labor, and afterward the urine has been found loaded with albumen. Here, it seems probable

that the violent spasmodic contractions of the muscles of the abdomen which attend the convulsions, have so interrupted the venous circulation of the kidneys, as to produce an intense, though temporary congestion.

But this condition may arise from causes altogether distinct from any mechanical interruption of the circulation. Any of the causes which produce active congestion of the kidneys, as, for example, a sudden cold, may develop albuminuria. I will mention a case illustrating this point, which I have recently had in my private practice. A young lady of twenty became pregnant two months after her marriage. Before this time, she had been regarded by her family as very delicate, but pregnancy seemed to make a great change in her system. In seven months, she gained twenty-four pounds in weight, and her general health had never been so good. In visiting another member of the family, I accidentally saw her at about the eighth month of gestation, and, as I was engaged to attend her at the time of her confinement, I was so struck by the change of her appearance, that I questioned her somewhat closely. The only symptom that she complained of was, that she was always "too hot," and this was constant. Every function seemed to be normal, but the appearance of her face so impressed me that I privately begged her mother to get a quantity of her urine and send it to me, which was done a few days afterward. The specimen was examined by Professor Austin Flint, Jr., and reported to be perfectly normal. The morning after this report, I was summoned to visit her, and received the following history: The evening before, a warm evening in April, she had taken rather a long walk with her husband; when she returned, perspiring quite freely, she went directly to her room, undressed.

and sat in her night-dress, with bare feet, for quite half an hour, by an open window. Her husband then came into the room, and, remonstrating with her for her imprudence, persuaded her to go to bed. In the night, she was awakened by a severe chill, which lasted a long time, but she again went to sleep, and did not awake until nearly eight. She then complained of a most intense headache, with nausea; she was excessively nervous, frequently asserting that she was dying. I found her with a very flushed face, conjunctiva very red, skin hot (temperature 101° Fahr.), pulse 112, hard, bounding, and, in addition to the headache, she now complained of a dull pain in the lumbar region. As she was confident that she had passed no water since the afternoon before, I persuaded her to make the effort at once, but she did not succeed in passing a teaspoonful. I now bled her from the arm, taking away about eighteen ounces, with great relief to her headache. She was directed to remain in bed, well covered with blankets, and to take a bottle of the solution of the citrate of magnesia. Any water passed was to be saved for examination. At my evening visit, I found her free from pain. At one o'clock she had passed four ounces of very dark, smoky urine, fully one-third of which coagulated on applying heat and nitric acid. The laxative commenced to act at four o'clock, and her bowels had been freely moved three times. I directed that large pieces of spongio-piline, wrung out of hot water, should be kept over the kidneys, and that at ten o'clock she was to have ten grains of Tully's powder with twenty grains of the bicarbonate of potash. On the following morning, in answer to my questions, she said that she had slept all night, and was now perfectly well. But she had passed no water since my last visit. She was

directed to take a tablespoonful of the following prescription, in a wine-glass of water, every three hours, and to drink freely the artificial Vichy water when thirsty.

℞.	Potass. citrat.,	℥ j.
	Syr. simp.,	℥ j.
	Aq. puræ,	℥ vij.
	Tinc. digitalis,	f ℥ jss.
M.		

The subsequent history of this case was to me both interesting and instructive. The husband was a young man of fortune and leisure, with some pretensions to scientific dilettanteism, and he at once procured all the materials for examining the urine, and Dr. Flint's little book. At every visit, from this time until the perfect recovery of his wife, I was shown by him a test-tube, with the result of the examination of the water last passed. In the twenty-four hours following the use of the prescription I have given, she passed twenty-eight ounces of water, specific gravity 1022, nearly one-fourth coagulated. From this time, the quantity and character of the urine constantly improved, and, on the ninth day after the attack, hardly a trace of albumen could be discovered. Labor came on somewhat prematurely, on the seventeenth day after the attack. It was severe, lasting ten hours, when I delivered her by the forceps of a boy weighing eleven and a half pounds. Ten hours after the labor, the water contained albumen, about one-eighth coagulating. On the second day, there was hardly a trace of albumen. Lactation was established, with considerable febrile disturbance, as she had small, retracted nipples, while the breasts were excessively swollen and painful. On the fourth and fifth days after delivery, albumen was very abundant, nearly as much so as at the time of her

first attack; but, on the eighth day, not a trace could be found; and, from this time, she convalesced rapidly.

I think that this case illustrates how albuminuria, to which the system was predisposed by pregnancy, was first developed by cold, subsequently reproduced by labor, and, afterward, by febrile excitement from lactation. Hervieux, physician to the *Maternité* Hospital, of Paris, in his recent great work "On Puerperal Diseases," seems to regard puerperal albuminuria as mainly caused by what he calls "puerperal poison," and as analogous to the albuminuria which occurs from the scarlatinal poison. Hereafter, I shall discuss more fully the views of Hervieux in regard to this puerperal poison, but at present I shall only say that he seems to me to give undue prominence to this as a cause. But clinical observation has amply demonstrated that convulsions, the various phlegmasiæ incident to the puerperal condition, the pyæmic diathesis, septic absorption, and puerperal fever, or any of these causes, may develop albuminuria, where it has before either been latent or has not existed at all. In practice, I have often been led to suspect that the presence of albumen in the urine has been regarded as a cause of the pathological phenomena, when in reality it was only an effect. Albumen in the urine is not the disease, but it is the aggregation of symptoms, of which this is one, that constitutes the disease that we call albuminuria.

The symptoms may be classified with reference to the nervous, the vascular, and the nutritive systems:

(1.) The most frequent and constant of the nervous symptoms is, perhaps, headache. When persistent, in the latter months of gestation, I think this should always be regarded as very significant, and particularly

so when it is associated with insomnia, impaired vision, hesitation or embarrassment in vocal utterance, and great nervous irritability. Delirium, coma, paralysis of special nerves, hemiplegia, and convulsions, are the full culmination of the nervous disturbances caused by albuminuria.

(2.) The most prominent symptom referable to the vascular system is œdema of the face and of the upper and lower extremities. This œdema is not always present, even in very severe cases of albuminuria, but it is sometimes observed in the face in the morning, after the woman has passed some hours in the recumbent posture, and entirely disappears during the day. Œdema, confined to the lower extremities, is not a diagnostic symptom of much value, as this may simply indicate obstruction of the abdominal venous circulation caused by the pressure of the gravid uterus. General anasarca is not very uncommon, and, in some cases, the whole areolar tissue seems to be infiltrated. In one woman, in my service in this hospital, this symptom existed to a most exaggerated degree, so that, on the side on which she lay, the neck, the breast, and, in fact, the whole side, were puffed out to an enormous extent.

(3.) Gastric irritability is important, when associated with the other symptoms mentioned. When albuminuria is of some weeks' duration, the appetite is generally lost, and there frequently are nausea and vomiting. Sometimes there is obstinate constipation, while, in other cases, there is a tendency to diarrhœa.

The urine is variable in quantity, being sometimes less and sometimes more than is normal. The specific gravity usually bears a certain ratio to the quantity, and ranges, in different cases, from 1010 to 1025. I shall refer to other symptoms in speaking of the effects

of albuminuria on gestation, parturition, and the puerperal state.

I shall first allude to its effects on gestation. The fact has been established by numerous observers, that abortion and premature labor are peculiarly liable to occur when the maternal system is suffering from albuminuria, and it can be readily conceived that the vitality of the ovum must be more or less impaired so long as it is nourished by blood impoverished by albuminuria, or poisoned by urea. In several instances, I have known this to be the apparent and probable cause of repeated abortions, or the premature delivery of a dead fœtus. One of my patients, who never gave birth to a living child, was prematurely delivered of four dead children. In her third pregnancy, she came under my care at the sixth month, on account of the symptoms characteristic of albuminuria, and a fœtus, which had evidently been dead for some days, was expelled, just after the seventh month of pregnancy had commenced. The symptoms of albuminuria rapidly disappeared, and she apparently quite recovered her health, until she became pregnant for the fourth time, when the symptoms reappeared at the beginning of the fifth month. As I was just leaving town to pass the summer in Europe, I placed her under the care of my friend and colleague, the late Professor George T. Elliot, and from him I learned that she suffered greatly from irritability of the stomach, persistent and intense headache, œdema, anæmia, and amaurosis, until the sixth month, when she expelled a putrid fœtus. She died of phthisis eighteen months after this, and it is worthy of remark that some months before her death the albumen disappeared from the urine, her sight was restored, and she was entirely free from gastric irritability, œdema, and headache.

Another of my patients was prematurely confined with three dead children. I first saw her on the fifteenth of September, 1861, when she found, on rising in the morning, that she was quite deaf, and that she had great difficulty in articulation. The face was very œdematous, and for some days she had been suffering from severe headache. On the 24th of October, she was delivered of a dead, hydrocephalic child. A few weeks after her accouchement, the deafness and difficulty in articulation entirely disappeared, and, two months after, I sent a quantity of her urine to Dr. Flint, Jr., for examination, who found it quite normal. In the first volume of "Transactions of the London Obstetrical Society," there is a report of a case by Dr. Tyler Smith, in which abortion, with albuminuria and convulsions, had occurred in six successive pregnancies.

It is unnecessary for me to multiply illustrations of a fact which has been so often observed. I shall only add that, in some cases reported by Hervieux and others, the albuminuria seems to have been the predisposing cause of a partial separation of the placenta, hemorrhage, and premature labor. It should also not be forgotten that the danger to fœtal life from this source is not confined to the period of gestation. The labor may be complicated with convulsions in the mother, which are very fatal to the child.

I shall not detain you now with a discussion of all the effects of albuminuria upon puerperal convalescence, but I will say here that it must be obvious, that the system which has been impaired for some weeks by this condition must be specially liable to the various puerperal phlegmasiæ, and particularly susceptible to morbific influences of an endemic or epidemic character. Then, again, you must remember that the various

puerperal diseases frequently develop albuminuria, when it had not previously existed.

Any attempt at formal statements with regard to prognosis in albuminuria would be but a reiteration, in other terms, of ideas that I have already expressed. You have observed that the greatest anxiety which the patient before you manifests, is with reference to the recovery of her sight; and you will naturally ask, "What encouragement am I warranted in giving her?" Although but few cases have been published of recovery of the sight, when seriously impaired as a result of puerperal albuminuria, yet I have seen several where it has been complete. I have already mentioned one. In another patient, who had the characteristic symptoms of albuminuria in the eighth month of her pregnancy, vision was impaired to such a degree that she she could barely distinguish the outline of objects when placed in a strong light. She had one convulsion previous to her labor, and five after the birth of the child. Her convalescence was rapid; the albumen disappeared from the urine, and her recovery was perfect in every respect, except her sight. I repeatedly urged her to consult some one of our eminent oculists. Three months after her accouchement, her husband determined to take her to Berlin to consult Von Graefe. On the voyage out, her sight manifestly improved, and, while in England, the improvement was so rapid that they deemed it unnecessary to consult any oculist, and she returned, after eight months' absence, with the sight perfectly restored. Three years after, she again became pregnant, and, in the last months of gestation, there were some symptoms of albuminuria, and some impairment of vision, but, in other respects, the pregnancy and labor were normal. I have attended her in

three subsequent pregnancies, without any recurrence of the symptoms of albuminuria.

In a discussion of this subject before the New York Academy of Medicine, our distinguished oculist, Dr. Noyes, stated that a colored woman came under his observation, "who had convulsions three or four weeks prior to delivery, and her sight had been impaired for two months, during which time the retina presented the characteristic appearances of fatty degeneration. She so far recovered that, after a period of ten months, she was able to read fine print. She afterward became pregnant, and miscarried at the end of the sixth month; and, although she had convulsions at that time, there was no increase of the eye-trouble."

A most striking case is reported in the July number, 1862, of the *American Journal of the Medical Sciences*, by Dr. Fourgeaud, of San Francisco, California. The patient had had several miscarriages, and two living children, who were born before the eighth month. Dr. Fourgeaud first saw her a week before labor came on, September 24, 1861. "Her face was then œdematous, and she complained of loss of sight, so that she was unable to read printed matter, or to distinguish persons a few feet from her." She was delivered, October 1st, "of a seven-months' child, which had been dead, to all appearances, for three or four days." Her labor passed off without convulsions, which immunity Dr. Fourgeaud attributes to the prophylactic treatment under which she had been placed for a week, and to the use of chloroform during the labor. On the morning after, the doctor found his patient paraplegic. "The motor power of both legs was entirely lost, sensibility being but partially impaired. There was paralysis of the rectum and sphincters, with involuntary

discharge of the fæces, paralysis of the bladder with retention of the urine, amaurosis, the eyesight being almost entirely gone." On the 22d of November, the doctor reports that the œdema had disappeared, and the paralysis of the legs was considerably diminished, and she had so far recovered her sight as to be able to read. I saw this lady at the Metropolitan Hotel in this city, in November, 1862, with my friend Dr. Fessenden N. Otis, under whose professional care she then was; and, so far as her sight was concerned, the recovery remained as complete as reported by Dr. Fourgeaud.

It seems to me, therefore, to be the duty of the physician, under these circumstances, as in all cases where there is paralysis or paresis of special nerves from a reflex cause, when this reflex cause has not produced a centric lesion, to give his patient the full benefit of a confident hope of restoration.

I shall add a few remarks with reference to the treatment of albuminuria in each of the three periods, pregnancy, parturition, and the puerperal state.

During pregnancy, the indications from this condition are:

(1.) To relieve the hyperæmic or congested kidneys by the use of laxatives, especially those which produce a hydragogue action, such as the bitartrate of potash, the compound powder of jalap, or the citrate of magnesia. These agents act on the mucous membrane of the intestinal canal in abstracting by exosmosis serum from the blood, while they do not diminish its corpuscles. In this way they take off part of the load which is imposed upon the kidneys. In conjunction with these laxatives, when the renal secretion is defective, we may use, both with safety and advantage, such diuretics as the acetate or the citrate of potash, assisted by

digitalis in small doses, but not long continued. The artificial Vichy and Seltzer waters may be drunk freely, and are often very grateful to patients, and decidedly useful as diuretics. When the attack is acute, and there is pain or tenderness over the kidneys, with a secretion of only a small quantity of smoky urine, dry or wet cups over the lumbar region often give relief, and increase the quantity and change the character of the urine. When albuminuria is associated with plethora, as manifested by persistent redness of the face, injection of the conjunctiva, hot skin, lancinating pains in the head, and a hard, labored pulse, denoting arterial tension, I am convinced that the use of the remedies that I have just spoken of should be preceded by a prophylactic venesection. The quantity to be abstracted for this purpose must be a question of judgment, to be determined by the special indications and the immediate effects produced, but I should say, in general terms, that it would probably be from ten to sixteen ounces.

(2.) To prevent the impoverishment of the blood which results from albuminuria. The statement of this indication may seem to conflict with the remarks that I have just made relative to venesection. But a little reflection will convince you that the two propositions are really not antagonistic. Cazeaux and others have shown that chloro-anæmia is a very common condition in pregnancy. In puerperal albuminuria, we often have hydræmia, and a kind of serous plethora, in which there is absolutely an excess in the quantity of blood, which causes great disturbance of the circulation, and local congestions. I am disposed to believe that the renal congestions from this constitutional origin are absolutely the predisposing cause of

many cases of puerperal albuminuria. At any rate, it is often found to be good practice to diminish the serum, and to increase the relative proportion of hematosine. So, after the use of the measures which I have just mentioned, you will frequently find it of great service to your patients to give them iron, and the best preparation for this purpose is, probably, the tincture of the chloride. It is not only useful in improving the condition of the blood, but it unquestionably exerts an influence as a diuretic.

(3.) To prevent the nervous disturbances which terminate in paralysis, or often culminate in convulsions. This implies care in preventing all emotional excitement, or in overtaxing the physical powers in every way, either by violent exercise or by household duties, a close attention to the digestive organs, and especially to guard against constipation. I am inclined, also, to think that the necessity for good ventilation and the free circulation of pure air in the sleeping-apartment is not sufficiently appreciated.

But, in spite of all these measures, and of every other resource at our command, these nervous disturbances will continue, in some cases to such a degree as to dangerously imperil the life of both mother and child. There, then, remains only one thing to do, and that is—

(4.) To induce premature labor. The propriety of this measure has been much discussed, and I suppose that professional sentiment is still not unanimous on this point. I shall not enter upon any elaborate argument in defense of my views, but I have no hesitation, whenever the symptoms from albuminuria are of so grave a character that there is every probability that their continuance will result in the death of the mother,

in advising and urging that labor should be brought on. I feel well assured that I have seen a number of valuable lives thus saved, which otherwise would inevitably have been lost. I have never regretted giving this advice. The only regret that I have ever had on this subject has arisen when such action has been too long postponed by baseless hopes on the part of those with whom I have been associated. The question is a much more difficult one, when it turns upon the propriety of the measure, solely for the purpose of saving the life of the child. But, even in this case, if there be a probability of accomplishing such a result, I hold it to be a duty. The success or non-success of the measure has nothing to do with the moral of the question.

I shall only add that such a measure as this should only be adopted after consultation, as it might be most hazardous for any one man, and particularly for a young man, to assume alone such a responsibility.

LECTURE VI.

PUERPERAL CONVULSIONS.

Case—Symptoms characterizing the convulsive paroxysms—Prodromic symptoms—Sometimes entirely absent—Case of the kind occurring some hours after labor—Headache the most frequent precursory symptom—Impaired vision the most significant—Œdema—Symptoms which indicate that an attack is imminent—Influence of convulsions on gestation, parturition and puerperal convalescence—Comparative fatality before and during labor, and after delivery—Symptoms on which to base the prognosis—Case of recovery from profound and prolonged coma—Case of recovery, and eventual recovery from hemiplegia—Recovery from convulsions, with permanent aphasia remaining.

"CASE VII.[1]—Bridget D——, Irish, primipara. Admitted into Bellevue Hospital two months ago, near the seventh month of pregnancy; labia, vulva, and lower extremities so much swollen as to pit upon pressure. Frontal headache and pain in lumbar region on first admission, but all these symptoms soon disappeared. Neither albumen nor casts found in the urine previous to her confinement, although several examinations were made. On the afternoon of September 16th, the patient was suddenly seized with a convulsion, characterized by all the usual phenomena, lasting five minutes, and leaving her in a semi-comatose condition. A more protracted convulsion followed about twenty minutes later. Dry cups were applied to the loins, and three drops of croton-oil placed upon the tongue; chloroform was then administered freely, and continued whenever convulsions were threatened, until the labor ended. As, after a proper interval, the croton-oil did not act, an enema of an ounce of castor-oil with three drops of croton-oil, and a pint of warm water, was then given, which moved the bowels freely

[1] Case reported by R. A. Vance, M. D., house-physician to Bellevue Hospital.

in about ten minutes. At 7 P. M., three convulsions occurred in rapid succession. During the intervals between them, the patient was semi-comatose, with pupils markedly contracted. After this, there was no recurrence of the convulsions until 4 P. M. of the 17th, when three occurred in rapid succession. A few moments before this attack, there were some manifestations of uterine contractions for the first time, and the cervix was now beginning to dilate. There was now an intermission of the convulsions (the patient moderately taking chloroform when there were any threatening symptoms, and whenever there were uterine contractions) until 3 A. M., of the 18th, when three more occurred, and, ten minutes after the last, the child was suddenly expelled alive. The placenta soon came away; the uterus contracted well, and there was little hemorrhage. The mother had three convulsions soon after delivery; as there had been scarcely any secretion of urine for the past twenty-four hours, and the patient remained unconscious, dry cups were applied over the kidneys. Soon after their application, she became conscious, and was able to swallow. Two drachms of the bitartrate of potassa were then given four times a day. After the first attack of convulsions, the urine for the first time contained a small amount of albumen, but no casts. On the first day after delivery, the urine contained about twenty-five per cent. of albumen. Puerperal mania was developed the second day after delivery, lasting two days. She has since done well, has had a good appetite, and has complained only of headache. To-day, the tenth since delivery, only a trace of albumen can be found in the urine. For six days past, she has been taking, three times a day, two grains of sulphate of quinia and fifteen drops of the tincture of the chloride of iron, with the most nutritious diet. Just after delivery, the child had a convulsion precisely like that of the mother, and in the course of two hours two more. It has since done well, has had no more convulsions, nurses well, and is thriving."

Gentlemen: Those of you who have never witnessed a case of puerperal convulsions will naturally ask first, "What are the phenomena which characterize these attacks?" Let me tell you that, when you have seen one case, you have seen the phenomena that occur in all, the difference being only as regards the frequency, duration, and intensity of the paroxysms. Frequently, the

attack occurs in the later periods of pregnancy, without any premonitory symptoms having been observed by the patient or her friends. Indeed, in the most severe and the most dangerous cases of puerperal convulsions that I have seen for some years past, the patients have had no premonitory symptoms to attract attention, and therefore have had no prophylactic treatment.

It may be that, while engaged in her ordinary occupations, she suddenly stops, becomes pale, with a fixed expression of her countenance, and a general immobility of her whole system. This lasts but a moment, when the eyelids begin to twinkle, the eyeballs to turn in their sockets, under the upper lid, so that only the white of the eye is seen; the angles of the mouth are drawn, producing a horrid grimace, which Baron Dubois has aptly compared to the countenance of the satyrs of the fable. The angle of the mouth being drawn up on one side, the face turns to the same shoulder, then the muscles of the face begin rapidly to contract, and this contraction almost immediately extends to the muscles of the trunk and the extremities. The neck swells, the jugular veins stand out prominently, and the carotids beat violently. The fists are doubled, generally with the thumb of one or both hands compressed in the palm by the fingers. Sometimes one arm is raised as if in an attitude to ward off a blow. The muscles of the throat and larynx strongly contract, and cause a momentary suspension of respiration; the face is intensely congested, and of a purple hue. This condition of tonic convulsion does not continue, ordinarily, more than twenty or thirty seconds, when it is followed by the clonic convulsive movements. Rapid, jerking movements of the muscles of the face, body, and extremities now succeed the muscular rigidity.

A short, noisy, broken inspiration, with stertorous expiration, is attended with the escape from the mouth of a white foam, sometimes bloody, from lacerations of the tongue. The patient can neither feel, see, nor hear. The circulation is soon influenced by the respiratory troubles. The spasmodic contractions of the diaphragm and the other thoracic muscles interrupt decarbonization and oxygenation; the pulse, which was at first hard and strong, now becomes rapid and feeble, capillary circulation is arrested, which causes a purple hue, particularly noticeable on the hands. Toward the end of this paroxysm, all these symptoms progressively disappear. The spasmodic movements of the muscles become less frequent and less violent, until they entirely cease, the respiration and circulation become regular, the superficial congestions disappear, and the surface recovers its natural color. This period of clonic convulsions lasts from two or three minutes to twenty. The tonic convulsions are really much more dangerous to life, and, when patients die in the convulsion, it is in this period, the death probably being due to asphyxia. But the phenomena of the clonic convulsions are usually much more frightful in their appearance to the uneducated by-standers.

Following these paroxysms, the return of the intelligence and sensibilities is not immediate. There is a period of coma, varying in character, profoundness, and duration, in a ratio proportionate to the intensity and severity of the convulsive attack. In some, this is little more than a profound somnolence, lasting but a moment or two, when the patient opens her eyes and looks around with astonishment at the objects about her. She slowly recovers her intelligence, but has no recollection of what has happened. In some, the sight or hear-

ing or memory is impaired, while in others, all the functions are restored, the recovery is complete, and there is no return of the convulsions. In others, again, after a period of a few minutes, or, it may be, of hours, in which the patient presents the delusive appearance of complete recovery, there is observed an unnatural calm and taciturnity, or a nervous agitation, which is the prelude to a new access of convulsions. After repeated convulsions, with increasing violence, the intervals of sleep are longer and more profound, and the woman is awakened with difficulty. With an appearance of effort, she opens her eyes, mutters a few incoherent words, makes some automatic movements, and again falls into a profound slumber. Finally, when the cerebral disturbance is excessive, the respiration becomes heavily stertorous, the coma is profound, and the convulsive paroxysms recur without any temporary intervals of consciousness; and this condition continues until terminated by death. One word in regard to this coma: it seems to be essentially different from, and to be due to another cause than the coma which is often an initial symptom of convulsions in Bright's disease. In the latter case, the brain is overwhelmed by a special poison, urea. In puerperal convulsions, the circumstances under which the sopor is developed, the characteristic signs of cerebral congestion which precede and attend this coma, as well as the evidences that have been accumulated by autopsic examinations, seem to demonstrate conclusively that this coma is the result of intense cerebral congestion, and sometimes of serous effusion. It has been shown in some cases that rupture of cerebral vessels has taken place, and a clot has formed, with its consequent paralysis.

Now, the inquiry will arise in your minds, whether

there be any signs which should lead you to anticipate these frightful attacks. I am compelled to answer that, in some few cases, the most careful observation will fail to detect any forewarning symptom. Near the end of gestation, some, whose condition has been apparently normal in every respect, whose urine has been carefully and frequently examined, without a trace of albumen being detected, have been suddenly seized with convulsions, even when no exciting cause for the accident could be ascertained. So, also, when the same conditions of apparent health have existed throughout gestation, parturition has gone on normally, until convulsions have occurred. In the winter of 1869, the wife of a physician in this city was delivered of a fine, healthy boy at eight o'clock in the evening, after a labor (not severe for a primipara) of nine hours. In the last months of pregnancy, her health had been better than ever before. Her husband had made almost daily examinations of the urine, without finding a trace of albumen. I have always suspected that he was over-anxious in regard to the dangers of post-partum hemorrhage, for he detailed to me with great minuteness the steps that he had taken to secure the firm and permanent contraction of the uterus, and added that the delivery of the placenta was not followed by the loss of an ounce of blood. I should say that she had not taken anæsthetics, as she objected to them; and, as she bore her pains very well, her husband had not urged the use of chloroform or ether. Soon after the labor was over, she took a small cup of panada, and then fell asleep for an hour or more. On awakening, she gave expression to her feelings of intense happiness, held her baby in her arms for a few moments, warmly kissed her husband good-night, and again fell into a

sound sleep. All arrangements for the night were then made, the nurse and child being in an adjoining room, with open folding-doors, while the husband lay down upon a sofa, which he had placed close by the bed of his wife. At two o'clock, he was awakened by finding her in violent convulsions. At 4 A. M., when I first saw her, she had had eight very severe convulsions, remaining, during the intervals, in a state of complete, unconscious coma.

As I shall refer to this case again, when discussing the cause and treatment of convulsions, I will now pass on to say that the cases of this kind, which occur either before or during and after labor without prodromic symptoms, are fortunately so few in number as to be rather exceptional.

The precursory symptoms of puerperal convulsions are now well known to the profession, and it cannot be doubted that, in many cases, this knowledge has been made available to prevent their recurrence, by a successful prophylactic treatment. The first and most frequent of these symptoms is headache, sometimes dull and continuous, and, in other cases, throbbing and recurrent. It is occasionally intermittent for days or weeks, until a few hours before the attack, when it becomes constant. It is frequently attended with vertigo on making any movement of the head.

The symptom next in frequency, and still more significant of danger, is impairment of vision. This, like the headache, is frequently temporary at first, afterward becoming permanent. In some, the sight, which had previously been good, appears to be suddenly lost.

In connection with either or both of the symptoms I have just described, I should mention œdema, particularly of the face, coexisting with œdema of the ex-

tremities. It occasionally happens that this symptom exists alone, and even this in so slight a degree, as not to be observed, unless carefully sought for, when the two other symptoms are wholly absent. Under these circumstances, it becomes an imperative duty to carefully and frequently examine the urine, and test it for albumen. Indeed, in this hospital, it is the duty of the house-physician, or his assistant, to make this examination of all the women in "the waiting-wards."

Whether albumen be or be not found in the urine, or even when the other symptoms I have just described are absent, if a pregnant or parturient woman suddenly complains of sparks before her eyes, or dimness of sight, or ringing in her ears, or difficulty in articulation, or suddenly becomes nervous, irritable, and complains of a severe pain in the head, the danger from convulsions is imminent.

You next ask, "What are the consequences of puerperal convulsions in the pregnant, parturient, and puerperal woman?

(1.) In the pregnant, they may bring on labor prematurely, destroy the life of the fœtus, of the mother, or of both. Happily, in some, they terminate in recovery, without either of these results.

(2.) The same consequences may follow when the convulsions occur during labor. If they be very severe and numerous, and occur for many hours previous to the termination of the labor, if they be associated with any cause of dystocia, as a bad presentation, a deformed pelvis, or hydrocephalus of the fœtus, the child is almost inevitably lost. If they occur in a mother severely suffering from albuminuria or who really has Bright's disease, or who is very anæmic, or if they develop cerebral lesion, the danger to life is very grave;

but even under these conditions we are not warranted in saying the case is hopeless.

(3.) After delivery, puerperal convulsions may be followed by severe and dangerous hemorrhage, due either to the exhaustion of nerve-power to such a degree that permanent uterine contractions cannot be effected, or to the condition of the blood, which from persistent albuminuria has lost its normal plasticity. This fact seems to have been first signalized by M. Blot, who published a case which occurred at the *Maternité*, where hemorrhage followed convulsions (the blood being fluid and decolorized), and resisted the most prompt and active treatment, the patient dying under his eyes, fourteen hours after delivery. Since the publication of this case, several other observers have noted the same result, and one has occurred in my service in this hospital. Case xciv., in the "Obstetric Clinic" of Prof. Elliot, is another illustration, I take it, of the same fact. Again, puerperal convulsions are frequently followed by puerperal mania. I have often seen this, and you will find numerous cases of the kind in the clinical reports of Johnston and Sinclair, Elliot, Hervieux, and others, and I will remark here, parenthetically, that mania follows puerperal convulsions in quite as large a number of cases where albuminuria has not existed, as in those where it has been present.

Another question of interest is, "In which period is the occurrence of convulsions the most dangerous?" Eighteen years ago, I published, in the *New York Medical Times*, a table of cases of puerperal convulsions which I had collected from all the sources accessible to me, and analysis of that table proved that thirty-two per cent. of all cases which occurred before and during labor, and twenty-two per cent. of those that occurred after de-

livery, ended fatally. Now, within a period of eighteen years, the true pathology of this disease is much better and much more generally known to the profession, and its therapeutics is still more improved, so that I have no doubt that the relative fatality has been diminished at least fifty per cent. I suppose that the proportionate fatality in the different periods has been considerably changed by the acceptance of the induction of premature labor as a therapeutic resource.

But death still too frequently results from puerperal convulsions. In some exceptional cases, this occurs during the paroxysm, from acute asphyxia. Much more frequently, the woman dies in the comatose period, from exhaustion and asphyxia combined; or the convulsions may directly or indirectly produce complications which cause a fatal termination. I have already mentioned hemorrhage as one. Cerebral hermorrhage, serous effusion, and meningitis, are to be included in these complications. Cazeaux lost two cases out of seven, which he had in a short period of time, and in both, the autopsy showed the anatomical characters of meningitis.

I must add that, while the albuminuria ordinarily disappears in the course of a week or so after delivery, yet it sometimes persists weeks or months, until at length the death of the woman results from the renal lesion.

As regards the child, Braun and Jaccoud deny that the convulsions may be propagated from the mother to the child. Simpson and others have held a contrary opinion, and the case which we have shown you to-day confirms this view. In two cases in private practice, the mothers had severe convulsions during labor, but recovered. In both, the child was born alive, but died a few hours after birth, from convulsions, precisely identical in character with those of the mother.

Now, let us next study the symptoms which indicate the probable termination of the convulsions, either by recovery or death.

We may anticipate recovery with a good degree of confidence, when we find the convulsive attacks are of short duration, and are not severe in their character, while the intervals between each recurrence become longer and longer. Especially may we be encouraged under these circumstances, if, on examination of the urine, we find that it contains but a moderate quantity of albumen, and is free from casts or blood, or other foreign elements which denote a profound lesion of the kidneys. Even if these signs of renal disturbance be present, we see occasionally that the casts entirely disappear after the third day following delivery, the œdema is wholly gone in a week, and the albumen is no longer to be found after a week or ten days.

In some cases, whether the evidence of renal trouble be present or wanting, it happens that the convulsive attacks are suspended for some hours, and then two or three come in rapid succession—they are again suspended, and again recur. This happened in the case that you have seen to-day. Now, in such cases, where no indications of albuminuria have previously existed, I am in the habit of predicting that albumen will subsequently appear in the urine. So, also, I expect it to be found, when absent before, if the convulsive attacks recur a great number of times, as I have seen them, ranging from twenty up to fifty or more within twenty-four hours. I am always hopeful, where there have been repeated, careful examinations made by competent persons, and the signs of albuminuria have been found wanting until after the attack of convulsions.

Again, when the signs of albuminuria are known

to have previously been absent, I am not discouraged, when convulsions produce cerebral troubles so profound as to be attended with deep and prolonged coma and slowly-recurring convulsive attacks. The case is not absolutely hopeless, even if we have the most marked evidences of albuminuria and serous infiltration. I learned a lesson on this point some fifteen years ago, from a case which Professor Alonzo Clark and myself saw in consultation with Dr. Livingston, of this city. I will give the history of this case, as communicated to me in a note from Dr. Livingston:

"The patient to whom you refer was delivered of a fine boy, July 19, 1857, at about 2 o'clock A. M. The labor was in every respect normal, and very rapid for a primipara. Presentation vertex, first position. Two hours after her delivery, I visited her again. She was as comfortable as any patient I ever saw in the like situation. Her skin was cool and moist, pulse calm and natural, and she was cheerful and disposed to jest at my needless anxiety in her case. I had only seen her the week previous, and was quite reluctant to assume the care of her, as she presented strong indications of albuminuria. She was very œdematous in the face, neck, and upper extremities, as well as the lower, and the urine was loaded with albumen. At about 5 A. M., three hours after delivery, I was suddenly summoned to the patient, with the statement that she was in a fit. When I arrived, a few moments later, I found her apparently as well as I had left her an hour before. The pulse only was a little excited. The convulsive paroxysms at first recurred at intervals of half an hour, but gradually grew more frequent and prolonged, and, by 11 o'clock A. M., the lucid intervals had ceased, and she was profoundly comatose. Mucus

began to be thrown in jets from the mouth and nostrils at every expiration, and it was necessary for one person to continually wipe her mouth and face on account of the abundant secretion, and she could only breathe at all by being held in the semi-upright position. The face was of a dark mahogany color, and much bloated, the pulse was entirely lost at the wrists, and the heart's action so feeble and irregular as to presage immediate dissolution. This was her state when you saw her, and turned to her friends with the remark that 'she must die;' and well you might, for, two hours before this, she was pronounced 'beyond human skill' by Prof. Alonzo Clark."

This patient entirely recovered, and Dr. Livingston attended her in two subsequent confinements, "both of which were normal and rapid, and the recoveries all that could be desired."

I have seen cases recover where the most serious cerebral troubles have apparently followed puerperal convulsions. In 1859, a lady, aged twenty-two, in her first confinement, was attacked with convulsions. Previous to labor, there were no signs of albuminuria, although I most carefully sought for them. She had a great many, I dare say more than twenty convulsions, and I delivered her by forceps while she was in a comatose state. She remained after delivery in a profound coma for thirty-two hours, and it was many hours after, before her intelligence was fully recovered. I discovered, as she came out of this state, that she had lost the power of movement, and, to a certain extent, the sensibility of the right side. But in a few weeks she was able to walk with assistance, and eventually without difficulty, although it was quite a year before she was able to write or to play upon the piano. In 1865, she was

confined with her second child, and attended by Dr. Elliot, as I was absent from the city. I have attended her in two confinements since, without the slightest abnormality occurring in either.

I must also mention to you the very curious, and, so far as I know, unique case of a lady whom I well know in this city. Nearly forty years ago, in her first and only accouchement, she had very severe convulsions, followed by long-continued coma. On recovering from this, it was found that she had quite lost the power of vocal expression. The only words that she has since articulated, have been "Oh, yes." She seems to retain her intelligence, understands every thing said to her, and takes the liveliest interest in every thing connected with her family and friends. I am not quite sure whether she reads or not. Her immediate family converse with her, apparently without difficulty. The varied inflections of the voice, in using the words "Oh, yes," and the number of times the words are repeated with different inflections at each repetition, distinctly convey, to those who are intimate with her, an affirmation, a negation, a statement, or an inquiry. The only irritation she ever manifests is, when she finds that she is not understood by those whom she has been with for some time, but who have not yet learned the meaning of her peculiar inflections.[1]

If you now ask me what are the signs which conclusively show that convulsions must terminate fatally, I shall find it difficult to answer you. I should advise you never to take it for granted that death must be the result, unless the breathing has stopped, and the heart has ceased to beat. But, otherwise, fight for life as long as you have a resource at command.

[1] It will be noticed that this case occurred long before the researches of Virchow and Kirkes, relative to the effects of cerebral embolism.

LECTURE VII.

PUERPERAL CONVULSIONS.

Case—Convulsions after labor—Ceased after bleeding—Urea in the blood, six times the normal amount—Recovery, and all signs of renal disturbance absent on the twelfth day after delivery—Case—Venesection—Delivery by forceps—Death on the third day after delivery—Fatty kidneys—Pelvic peritonitis.—Case—No signs of albuminuria—Death—Serous effusion in the subarachnoid cavities and ventricles of the brain—No renal lesion—Puerperal convulsions always of the same character—No reason for classifying them as apoplectic, epileptic, hysterical, etc.—Etiology of puerperal convulsions—Suggestions made in 1862 before the New York Academy of Medicine—Rosenstein's views published in 1863—Dr. J. Braxton Hicks's paper, before the London Obstetrical Society—Frankenhaueser's plates demonstrating the connection between the nerves of the uterus and the renal ganglia—Dr. Tyler Smith's theory—Treatment, before and during labor—After labor—The improvement in treatment as shown by comparison of the proportionate mortality at the present time, with that of former periods.

"Case VIII.[1]—Maria ——, aged twenty-six, married, Irish, primipara, was admitted into the hospital in labor, and sent to the lying-in-ward, on the evening of January 3d. She had an easy and rapid labor, and gave birth to a living female child. She gave no history of previous convulsions, but she had œdema of the feet and legs, and for some days she had suffered from headache and impaired vision. Two hours after delivery, she awoke from sleep, said she was frightened, and immediately had a convulsion, and, before eight of the morning of January 4th, she had nine more. In the intervals, she was in a semi-comatose condition, but could be roused to swallow. During this time, she had taken, in divided doses, a half-grain of elaterium, and she had had two enemata, by means of which the bowels were moved once pretty freely. After

[1] Case reported by Frank T. Kinnicut, M. D., house-physician in Bellevue Hospital.

this she lapsed into a completely comatose condition, with loud, stertorous breathing. Pulse was strong and slow. The hot-air bath was now tried, and chloroform cautiously administered when her appearance threatened a convulsion, but between 8 A. M. and 1 P. M. she had three more convulsions. At 1½ P. M. she was seen by Dr. Barker, and ordered another half-grain of elaterium, of which she had already taken a grain. But, while Dr. Barker was still in the ward, she had another convulsion of so violent and prolonged a character, that he determined to bleed. The median cephalic vein was opened and nearly forty ounces of blood were abstracted, and the patient seemed to be immediately relieved. The pulse, which before had been strong, full 80 per minute, now became soft and frequent, and rose to 120. In forty-five minutes it fell to 108. At 3½ P. M., one hour and three-quarters after the bleeding, the patient was sleeping very quietly, and the pulse was 96. At 5½ P. M., the pulse was 80. The patient opened her eyes and swallowed some milk and wine. Up to this time, since her admission into the hospital, the patient had passed no water. An ounce and a half was now drawn off by the catheter. She was ordered thirty grains of citrate of potassa, to be taken in syrup and water every third hour. She now fell into a slumber, which lasted until morning, except when she was roused to take her medicine.

"*January 5th*, 8 A. M.—Patient passed nearly a quart of water, which, on examination, was found to be heavily loaded with albumen. Fully one-half solidified by heat and nitric acid. Continue the medicine. In the afternoon, the bowels were freely moved by a very watery discharge, apparently from the elaterium.

"*January 6th.*—Patient has had no convulsion since she was bled, passes water freely, which still contains albumen abundantly. Continue the medicine. To have beef-tea and milk, all she wishes.

"*January 10th.*—Patient has steadily convalesced without a single unpleasant symptom. Says she is perfectly well. Urine still contains some albumen.

"*January 15th.*—Patient quite well, went to amphitheatre before the medical class."

Gentlemen, before entering upon a discussion of the general subject of puerperal convulsions, I wish to call your attention to a few points of special interest in this case:

(1.) You will observe that this patient had no more convulsions after she was bled. My reasons for bleeding were—(*a.*) To remove the vascular tension of the brain, and ward off the danger of secondary cerebral lesions. (*b.*) To take off the pressure on the laboring heart, and relieve the congestion of the lungs, and thus avert the danger from asphyxia. If you had seen her swollen, mahogany-colored face, and heard her laborious, stertorous breathing, you would have been convinced that this was no hypothetical apprehension. (*c.*) To remove from the system urea, an active narcotic poison. Dr. B. W. Richardson says, that experiments have shown that of two animals, each with the function of one kidney suppressed, one will die if left alone, while the other will recover, if, when the coma and convulsion of uræmia appear, there be abstraction of blood. Now, in this case I had two good reasons for believing that the patient was suffering from uræmia; first, the functions of both kidneys were almost entirely suppressed, for she had secreted less than an ounce and a half of urine in eighteen hours; and, secondly, I learned from the house-physician, who was with her during labor, that at that time "she hardly lost blood enough to stain the bed."

It is only in a very few instances of puerperal convulsions, so far as I know, that this excess of urea has been demonstrated. In one, a patient whom I saw with my colleague, Professor Sayre, the blood was analyzed by Professor Doremus, and was found to contain urea largely in excess, although I have forgotten the exact proportions. But I remember that the urinous odor was very strong, as the blood was being evaporated down for analysis. In this, as well as in another case, the history of which you will hear, and the autopsic results

you will see, I am fortunately able to demonstrate the fact of excess of urea in the blood. Dr. Thomas K. Cruse, one of the senior assistant house-physicians of this hospital, has made an analysis of the blood taken from this patient, and has proved that it contains 1.0 part of urea to every 960 parts of the other constituents. Picard, of Strasbourg, who, I believe, is the latest authority on this subject, states that the normal proportion of urea in the blood is 0.16 part per 1,000; but, in the puerperal state, this proportion is somewhat increased, that is, it is 0.18 part per 1,000. Thus you see that the proportion of urea in the blood of this woman was just about six times greater than the normal proportion in puerperal women.

(2.) You will please remark how rapidly the functions of the kidneys were restored, after bleeding had relieved the congestion of these and the other vital organs. In eighteen hours after venesection, she secreted and passed fully thirty ounces of urine.

(3.) In twelve days, all evidence of renal disturbance has entirely disappeared. You see that, by applying heat and nitric acid, we do not now find a trace of albumen in the urine.

Now, let us contrast this case with another that we have just had in our wards:

"Case IX.—*January 8th.*—Matilda ——, age unknown, was brought to the hospital from Staten Island, where she had been seized with convulsions. It could not be ascertained how many she had before admission, nor could any thing be learned of her previous history. There were some indications that labor had begun, and she was at once taken to the lying-in ward. Fifteen minutes after she entered this ward, she had a very severe convulsion.

"A half-grain of elaterium was now given, and chloroform was employed to ward off the convulsions. Dr. Barker was now sent for, but, before his arrival, she had two more very severe convulsions.

Venesection was recommended, and twenty ounces of blood abstracted. For a time, her breathing and general appearance were considerably better. The catheter was used, and little water was found in the bladder, but this was very albuminous. One hour after the bleeding, she had another severe convulsion, after which the bowels were freely moved. Three hours now passed without a recurrence of the convulsions, when, at 11½ P. M., they again returned, and she had three very severe attacks in rapid succession. As labor did not seem to progress, and the patient was apparently growing more feeble, the pulse becoming smaller and more rapid, the os was dilated by the fingers sufficiently to introduce one of Barnes's dilators, after which she was delivered by forceps, at 2½ A. M., January 9th, of a still-born child.

"*January 9th.*—Patient has had no convulsion since the delivery, but remains very feeble. With difficulty roused to speak or to swallow. Pulse 120; respiration 20; temperature 101°.

"*January 10th.*—Condition much the same, except that the respiration is more frequent (32 per minute), and the temperature is 104.5°.

"*January 11th.*—Patient died early this morning, fifty hours after delivery."

Please, now, to examine the kidneys taken from this poor woman, which will be passed around the amphitheatre. You will see that the capsules are loose, and separate with great ease. The cortical surface has numerous elevations and depressions, and its substance is softened, and easily breaks down on pressure. The capillaries of the Malpighian tufts and the minute arteries of the cortical substance contain numerous oil-globules. In short, by the microscope, it was difficult to find healthy structure of the cortical substance in any part, as the kidneys were in an advanced stage of Bright's disease. The liver was fatty, and adherent to the diaphragm, from antecedent inflammation; spleen normal; lungs healthy; heart, slight thickening of the mitral valves, but in other respects normal. The peritonæum, especially in the pelvic region, was, to a considerable

extent, mottled with fibrinous flakes, and the pelvic cavity, especially in the anterior and posterior culs-de-sac, contained a large amount of pus.

You have thus had the history of two cases of puerperal convulsions, one of which was associated with temporary albuminuria, that disappeared rapidly after delivery, and the other with Bright's disease.

Let me now read to you the history of a third case, that occurred in this hospital a few years since, from notes given me by Dr. Sebastian Amabile, formerly a house-physician. In this case, puerperal convulsions terminated fatally, although there was neither Bright's disease nor even temporary albuminuria:

"Case X.—This patient was brought to the hospital on Sunday, September 11th, by a policeman, who said that she had passed the night before in the station-house, and that, early in the morning, she had a fit, with frothing and bleeding from the mouth. A police-surgeon was sent for, who arrived about two hours after the fit. She was then conscious, and he advised that she should be sent to Bellevue. On admission, she refused to give her name, was very depressed and taciturn, but, little by little, she gave the following history, which was all that could be learned:

"Age nineteen; born in Maine, not far from Bangor; mother died when she was a baby; father living; has half brothers and sisters. Came to the city, by boat, Friday morning; walked the streets, and tried to get into several hotels, but was refused admission, and bought some cakes from a stand to eat. In the night, sat down on some steps, and fell asleep; was awakened in the morning by a policeman, who was very rough. Her gloves, veil, shawl, and money had been stolen while she had been asleep. She does not recollect what she did on Saturday, or how she went to the police-station. This was all that could be got from her. Her dress was draggled, but of good quality; and her manner and language indicated a good education. It was apparent that she was near the end of pregnancy, but she would answer no questions on this subject, and seemed much frightened when such inquiries were made. With difficulty, some of her urine was obtained, and found entirely free from albumen. She passed her time in weeping or reading, never

speaking to any one, except very reluctantly answering my questions. She complained of nothing, and, when asked, always replied that she was well. On the Tuesday following, September 13th, while sitting by her bed, she suddenly fell upon the floor in a severe convulsion. This could not have lasted more than a minute; for, on entering the ward, I found her staring wildly around, and she was soon perfectly conscious. As it could not be ascertained when the bowels had been moved, I now gave her hydrarg. chlor. mit., gr. v, pulv. jalap., ʒj, ol. tiglii, gt. j, at 10 P. M. Four hours after, as no effect had been produced by the medicine, an enema was ordered, but, before it could be given, she was again seized with convulsions, which recurred every five or ten minutes, she remaining profoundly comatose in the intervals. Before the arrival of Dr. Barker, who had been sent for, she had fourteen convulsions, without an interval between any two, longer than ten minutes. A catheter was now introduced, and twenty ounces of urine were drawn, which, on examination, was found wholly free from albumen. The pupils were contracted almost to a point, and did not dilate when suddenly exposed to the light of a candle. On auscultation, the uterine souffle and the sounds of the fœtal heart could plainly be heard, although beating over 180 per minute. As the head was in the pelvic cavity, although not pressing on the perinæum, and the cervix was dilated about two and a half inches in diameter and evidently dilatable, Dr. Barker now introduced the forceps and delivered, in less than five minutes, a living child, weighing eight and a half pounds. A few moments after, the placenta was found to have come away, with a considerable, though not an excessive, quantity of clots. The uterus contracted well. For something more than an hour, the breathing was very loud and stertorous, after which, she went into apparently a profound sleep, without stertor. At 5 A. M., six hours after delivery, she awoke, and swallowed nearly a cupful of water. Her pulse, during this time, was generally 140. The seven succeeding hours, she slept soundly, without stertor, now and then partially awakening for a moment. At twelve, noon, thirteen hours after delivery, she awoke to full consciousness, asked several questions, and talked more than she previously had, since her admission. She also drank a cup of the hospital beef-soup. The nurse brought her child to her. She took it, looked at it very fixedly for a moment or two, and then threw it from her with such violence that it would have gone upon the floor, had it not been caught, and she immediately went into a convulsion of great severity. This was

followed by stertorous coma, in which condition she remained for three hours, and then died.

"Examination, twenty-five hours after death. Slight laceration of the fourchette, but none of the muscular structure of the perinæum. Uterus well contracted, but contained three small clots, neither of which was larger than a Lima-bean. Other pelvic organs healthy. The same was true of the other abdominal and the thoracic organs. The cerebral vessels were very markedly injected; and, in the cavity and lateral ventricles, it was estimated that there were quite two ounces of serum. There were no clots or ruptured vessels. The structure of the brain seemed perfectly normal. At the request of Dr. Barker, the kidneys were submitted for inspection to Professor Alonzo Clark, who pronounced them slightly congested, but, in other respects, perfectly healthy."

Let me remark here that many writers have sought to divide puerperal convulsions into different classes, based either upon the difference of phenomena supposed to be offered in different cases, or upon differences in the constitutional condition of the subject in whom the attack occurs, or upon a theory of the cause of the convulsions. Thus, one author would make three classes; the apoplectic, the epileptic, and the hysterical. Another would divide them into the uræmic, the hyperæmic, the anæmic, and the hysterical. Another would only make two classes, the uræmic, and the hysterical. My friend and colleague, Professor Elliot, followed this last division, calling those convulsions which were general in their character, and attended with loss of consciousness, eclampsia; and he believed that these were always associated with renal lesions. But, in his "Obstetric Clinic," he gives one case of hysterical convulsions, as he terms them, which terminated fatally, and the autopsy revealed cerebral but no renal lesions; and another case, in which there was subsequently hemiplegia. In my lectures, a few years ago, I was accustomed to make a similar classification; but I am now convinced

that any such division of the forms of puerperal convulsions has no clinical basis. I have been for some years watching this point closely, and I now believe that we meet with puerperal convulsions precisely identical in their character, but associated with, or caused by, entirely diverse anatomical lesions. I now give up the term "hysterical" as applied to any puerperal convulsion; because I believe that we meet with convulsions, developed by emotional causes, unassociated with any anatomical lesion, except so far as the general system is modified by the condition of pregnancy, precisely like, in all respects, those convulsions that are due to, or are associated with, albuminuria or uræmia. I do not think the most skillful word-painter could have described any difference between the character of the convulsions in the three cases, the histories of which you have just heard.

For twenty years past, there has been going on a most active inquiry as to the etiology of puerperal convulsions, with constant additions to our knowledge of the subject, and frequent modifications of theory; but, even at the present day, science has not settled the question. The prevailing opinion, with a great majority of writers on this subject, has been, that puerperal convulsions result, in a very large proportion of cases, from toxæmia, the special poison being uræmic. Many eminent authorities have gone so far as to assert that, excluding hysterical convulsions, the cases, not due to this cause, are exceptional. I take it for granted that none of you suppose that albumen in the urine, of itself, is the cause of the convulsions; but the belief has been that, where this is found, the urea is retained in the blood, and that this substance is, either directly or by its decomposition, a poison which produces a most deleterious and profound impression on

the nervous system. The proposition of Dr. Carl Braun, of Vienna, that, "eclampsia parturentium is *commonly* the result of uræmic intoxication, arising from Bright's disease, and produced mostly by carbonate of ammonia in the blood, and perhaps also extractive matters of the urine," was for a time very generally accepted. Now, as to the ammonia part of this theory, which originated with Dr. Frerichs, of Berlin, the experiments of my colleague, Professor Hammond, published in the *American Journal of Medical Sciences*, January, 1861, seem to prove that there is no reason to believe that urea in the blood does decompose into carbonate of ammonia, and to demonstrate that the symptoms of uræmic poisoning are not produced by such a decomposition. Then, as I think, the other part of the proposition by Dr. Braun should be greatly modified. That excess of urea in the blood is an active poison, which exerts its toxæmic effects on the brain and whole nervous system, and causes convulsions, and that puerperal convulsions are frequently associated with albuminuria, are now accepted facts.

(1.) But there are many cases of puerperal convulsions, having all the characteristic phenomena which attend this fearful malady, in which there have been no symptoms indicative of any lesion of the kidney. The most careful and repeated examinations have failed to detect albumen or casts in the urine, either before or after the occurrence of the convulsions. In many cases, when death has resulted from the convulsions, only the most trivial lesion of the kidney, as slight congestion, has been found in the autopsic examination. It is no longer true, as some have said, that these lesions are not found because they have not been sought for, for they have been sought for by competent observers.

(2.) In a large proportion of marked cases of albuminuria during pregnancy, convulsions do not occur.

(3.) In many cases where the most careful and repeated examinations of the urine have failed to detect albumen, and there have been no other signs of albuminuria, convulsions have occurred, and, afterward, the urine has been found loaded with albumen. It seems to me, therefore, that there may be some reason for inquiring whether the association of albuminuria and puerperal convulsions necessarily proves the relation of cause and effect, or whether it may not be that the same profound impression on the nervous system which, in the pregnant or parturient woman, culminates in puerperal convulsions, may not also so modify the functions of the kidneys as to produce albuminuria.

In a discussion on albuminuria, before the New York Academy of Medicine, in 1862, I emphatically brought out these three points, as you will find in the second volume of the Bulletin of the Academy. I dare say the same ideas had occurred to others, but I know of no published expression of them until the work of Rosenstein ("Die Pathologie und Therapie der Nieren-Krankheiten," Berlin, 1863). As this treatise has not been translated into English, I will give you a condensed abstract of the views of the author on the point that we are now discussing. Rosenstein admits the frequent congestion of the kidneys as a result of mechanical pressure in pregnancy, which is manifested by the presence of albumen and casts in the urine, and, often, actual diminution of the urinary secretion. This congestion, however, he asserts, is not confined to the kidneys, but extends to the liver, and possibly to the spleen. At the same time, in a majority of the cases, the patient is hydræmic, and exhibits dropsical ten-

dencies. He also admits the coincidence, in a certain proportion of cases, of albuminuria with convulsions during gestation, but, in common with other observers, he finds, in the large majority of cases, that the eclampsic attacks occur during or subsequent to parturition. The act of parturition and the consequent disturbances of circulation are thus shown to exert great influence in developing eclampsia. Moreover, he says, the attacks usually occur just at the time when the albuminuria has been occasioned by excessive local congestion, and at a time when the structural alterations of the kidneys are not such as to occasion uræmic poisoning. Besides, in those cases where diffused nephritis really has existed, no convulsions have taken place. Again, he adds, there are frequent enough observations of puerperal convulsions without albuminuria. Now, in view of these facts, and taking into consideration the great nervous reflex excitability of pregnant women, especially primiparæ, and the tendency therefrom to affections of the nervous system; taking into account, also, the condition of the blood during pregnancy, and its tendency to transudation; considering, moreover, the frequent occurrence, as shown by autopsies, of œdema and anæmia of the brain, Rosenstein says, we are perhaps justified in regarding eclamp sic convulsions as a phenomenon attending the alteration of the circulation within the brain. For, under the influence of a process like parturition, through the action of the entire muscular system, an enormous pressure is exerted upon the aortic circulation, which in the presence of a dilute serum, and acting upon the finest arterial vessels, occasions œdema and secondary anæmia of the brain, and thus may call forth convulsions. At any rate, he says, the identification of the eclampsic

manifestations with those produced by uræmic intoxication ought to be maintained only in cases where there is really considerable suppression of the excretion of urine, and in which urea or some of its products can be detected in the blood.

In the discussion before the New York Academy of Medicine, which I have before referred to, I asked: "Have we not some reason for inquiring whether the same profound impression on the spinal system, which, in the pregnant and puerperal woman, culminates in puerperal convulsions, may not also so modify the functions of the kidneys, as to result in albuminuria; or, in other words, instead of regarding the albuminuria as the cause of the convulsions, have we not some reason for believing that both the convulsions and the albuminuria are the effect of some common cause, the exact nature of which science has not determined?"

In 1866, Dr. J. Braxton Hicks, of London, Physician-Accoucheur to, and Lecturer on Midwifery and the Diseases of Women at, Guy's Hospital, read a very able and remarkably suggestive paper on this subject, before the Obstetrical Society of London. You will find it in vol. viii. of the Transactions of this Society, and it is well worthy of your careful study. It is mainly devoted to the discussion of those cases in which the signs of albuminuria are not manifested before the eclampsic attacks, but are very evident afterward. Or, to quote his own words, such cases as the following:

"A woman approaching the full period of pregnancy, apparently in perfect health, without albumen in the urine, is suddenly seized with an epileptiform attack. After a certain time has elapsed, albumen is noticed in the urine, at first in small quantities, shortly

in profusion; then blood-globules, waxy and epithelial casts are found in it. At this time, the urine becomes scanty, of high specific gravity, with very high-colored crystals of lithic acid in considerable quantity. The case, which is now one of acute desquamative nephritis, may terminate by gradual recovery, the albumen slowly disappearing; or death may ensue from the violent effects of the original attack, or from the retention of urea, etc., in the system, in consequence of the acute mischief in the kidneys. Now, if these cases can be shown to occur, and if albumen in the urine be an indication of uræmia, and if those experiments above quoted be right; viz., that twenty-four hours at least, after the kidneys have ceased to act, must elapse before symptoms of uræmic poisoning can occur—then it follows that the convulsions cannot be owing to uræmia, at least the result of kidney-disease. If this point be granted—and it seems that, so far as our present knowledge extends, it must be—then the only modes of explaining the occurrence of the acute nephritis are in one of these three ways: either—

"1. That the convulsions themselves are the cause of the nephritis.

"2. That the nephritis and the convulsions are produced by the same cause; e. g., some detrimental ingredient circulating in the blood, irritating both the cerebro-spinal system and other organs at the same time.

"3. That the highly-congested state of the venous system, as is produced by the spasm of the glottis in eclampsia, is able to produce the kidney complication."

Since the publication of this paper by Dr. Hicks, a work has appeared, "On the Nerves of the Uterus," by Frankenhäuser, of Jena, based on careful dissec-

tions, and illustrated by most beautiful plates, in which is demonstrated a direct connection between the nerves of the uterus and the renal ganglia. This discovery, if it prove true, may be the means of leading to an explanation of the true pathology of puerperal convulsions. Frankenhäuser reasons, from his discoveries, that the theory, that the albuminuria of eclampsic patients is due to pressure of the distended uterus upon the large abdominal vessels or the renal vessels, is highly improbable. He says that, to be sure, many circumstances seem to favor such a view, as, for example, the more frequent occurrence of eclampsia in twin pregnancies, in primiparæ with unyielding abdominal parietes, in persons of small stature, etc., but he thinks also, that the same causes could equally well serve to excite the renal nerves, and those in connection with them. He finds another argument in the fact that we frequently observe that women have no convulsions who have suffered from albuminuria, both before and after pregnancy, the direct result of renal degeneration, in which, therefore, renal congestion really existed. He therefore considers it questionable whether the access of albumen, which is observed after puerperal convulsions, is the result of congestion, or is due to the excitation of the uterine plexus. He believes that the sudden occurrence of the eclampsic attack following all external sources of irritation (as pressure of the fœtal head upon the cervix, digital examinations, etc.), and from emotional causes, goes to prove that the nervous system, and not the vascular system, is the starting-point of puerperal convulsions, and that the changes observed in the kidneys of women dying from convulsions are too trivial and transitory, to indicate a long-continued congestion; and further, in confirmation of

these views, are to be added, the undeniable cases of convulsions when no albuminuria has existed. All these facts, in his view, point to the importance of the connection between the uterine and the renal plexus. I must add, that the theory of Frankenhäuser seems to have been anticipated, many years before, by Dr. Tyler Smith, of London, who suggested that the albuminuria "may depend upon sympathetic irritation of the kidneys by the gravid uterus, similar with the irritation of the salivary glands, the mammæ, the thyroid, etc., and not upon mere pressure."

In conclusion, then, I will say that our present knowledge of the etiology of puerperal convulsions may thus be concisely stated. Clinical observations have established these facts, that the following conditions are predisposing causes of convulsions in pregnant, parturient, and puerperal women; viz., albuminuria, hydræmia, anæmia, uræmia, and primiparity. Perhaps I should add, hereditary and atmospheric influence. By the former term, I simply mean that an excessively nervous temperament has been inherited. My attention was first directed to atmospheric influence as a predisposing cause, from the singular experience of one day in the winter of 1870, in the course of which I saw the following cases: Early in the morning, a lady, with Dr. Cheesman, in the eighth month of pregnancy, in violent convulsions associated with albuminuria. Soon after, with Drs. Sabine, George A. Peters, and Professor McLane, a primipara, in uræmic coma, some hours after delivery. Another, with Dr. Howard Pinkney, a primipara, in convulsions, and also two cases of convulsions in my service in this hospital. On another day of the same week, I saw, in consultation, three cases of eclampsia. At a meeting of the Obstetrical Society of

this city, I mentioned these facts, and asked the experience of the members on this point. Since then I have found that atmospheric influence has been alleged as a predisposing cause, by Andral, Dugès, and other French authors, and by Smellie, Denman, Ramsbotham, Davis, and Simpson, of the English authors.

Of the exciting causes of puerperal convulsions, I will briefly say that, in highly-nervous temperaments, and in the very impressible nervous systems of those suffering from anæmia, albuminuria, or uræmia, any thing which produces direct or indirect irritation of any part of the nervous system may bring on convulsions—as, in the pregnant, indigestion, constipation, retention of urine, excessive distention of the uterus, reflex pains, or moral shocks; or during labor, besides all these causes which I have just mentioned, every thing which makes pain severe, whether it be pressure of the head on the cervix, rigidity of the soft parts, the irritation from digital examinations, and all varieties of dystocia. Convulsions occurring after labor are probably due to those exciting causes which labor has developed, as the accumulation of urea in the blood during labor, cerebral or renal congestions, the sudden changes in the circulation following the removal of long-continued pressure on the great abdominal vessels, exhaustion of nerve-power, and moral disturbances.

We now pass to the most important part of the subject, the treatment.

As to prophylactic treatment, I shall refer to what I have said in regard to the treatment of albuminuria, as immediately bearing on this point in, probably, a majority of cases. I cannot go so far as Dr. Tyler Smith, who, in speaking of albuminuria, remarks: "It has been said that this disorder cannot be arrested during preg-

nancy, but I have never met with a case that resisted treatment, unless it had been neglected until the end of gestation." While my experience will not warrant me in making so strong an assertion, yet I can truly affirm that I now rarely encounter puerperal convulsions, when the previous detection of albuminuria has led me to be particularly apprehensive of their occurrence. Indeed, I will go farther, and say that, in most cases, where any of the predisposing causes that I have mentioned are discovered sufficiently early, they may be successfully treated, and convulsions will occur only in a small percentage. The removal of renal congestion by saline and hydragogue laxatives, which diminish, by exosmose, the excess of serum; by mild diuretics and the free use of mineral drinks, to carry off the cylindric exudations that obstruct the uriniferous tubes; the cure of anæmia by the chlorate of potassa, and iron; a nutritious diet, and moderate exercise in the open air; the relief of local congestions, uterine, renal, and cerebral, by judicious venesections, are all prophylactic measures against puerperal convulsions. If these measures fail, and the symptoms of threatened convulsions be imminent, we have another prophylactic resource in the induction of premature labor. In addition to what I have said on this point in connection with albuminuria, I shall only add that, in six of my private patients, I have felt it a duty to adopt this resource. In two of them, the child was born feeble, but afterward did well. In the other four, the death of the child was believed to be well assured before the means were used to provoke labor. In two cases, that I saw with Professor Elliot, which he alludes to in his "Clinic," we decided that this measure was necessary, and one of the patients gave birth to a living child. Every one of these ladies has

since been pregnant, and given birth to living children, one or more. In another lady, suffering from albuminuria in an extreme degree, whom I saw several times with Professor J. W. McLane, we had decided on bringing on labor before a convulsion occurred, but one or more attacks of eclampsia took place before we commenced the measures for this purpose. The child was evidently dead before the labor. I am told that this patient has happily gone through with her second pregnancy, and given birth to a living child. Now, in these nine patients, the symptoms were such as to leave the firm conviction on my mind that death would have resulted had not premature labor been induced.

During labor, the only prophylactic treatment that I think it necessary to specify, aside from all those hygienic measures that good sense would naturally suggest, is the use of chloroform and early delivery, as soon as the condition of the parts will permit.

In a paper on the "Treatment of Puerperal Convulsions," read before the New York Academy of Medicine, in 1855, and published in its Transactions, I expressed the opinion that the use of chloroform would diminish the fatality from this disease at least fifty per cent. I think that the united experience of the profession, in the seventeen years that have elapsed, has fully verified the prediction.

After labor, when the antecedent symptoms have been of such a character as to create an apprehension of convulsions, I should urge the following, as prophylactic measures:

(1.) At the time of delivery, permit the patient to lose a moderate amount of blood, not enough to weaken her, but sufficient to restore the equilibrium of the circulation. The patient actually requires less

blood than before delivery, when the uterine system demands an increased supply, and two beings are to be nourished.

(2.) Watch carefully the renal secretion, and do not permit the bladder to become distended.

(3.) If the patient is irritable, restless, complains loudly of little annoyances, and is sleepless, tranquillize her by a moderate opiate. The propriety of using opium in any cases of threatened or developed convulsions is a controverted question, but I shall presently give you my reasons for believing it often both safe and useful.

Before giving you the plan of treating puerperal convulsions, which I shall recommend, let me urge upon you the importance of thoroughly studying this subject, and fixing in your minds the rules of practice which you intend to follow, so that, when the occasion demands, you may act promptly, without doubt or hesitation. This will enable you to preserve a cool, calm, self-possessed manner, which will dominate over the alarmed friends in the room, and may react more or less on the patient herself.

First, ask yourselves what is to be done during the convulsive attacks. Place a cork or some other substance between the teeth, so as to prevent the severe lacerations of the tongue, which sometimes occur. Do not permit two or three persons to hold the patient down upon the bed, or forcibly to restrain the convulsive movements; but, nevertheless, she should be prevented from throwing herself off the bed. Keep the room quiet, cool, and well ventilated. See that nothing in her dress embarrasses either the circulation or the respiration. This is all that you can do during the attacks. Now, then, what is to be your treatment afterward?

(1.) When the attack occurs before labor, if the pulse be strong and hard, with great fullness of the vascular system, and the appearance of the face indicate cerebral congestion, bleed at once. The bleeding is sedative to nervous irritation; it removes the tension from the brain, and protects it from the injury which might otherwise result from the convulsions; it relieves congestion of the kidneys and lungs, and takes off the pressure from the laboring heart; and it may be that it supplements the action of the kidneys, and removes from the blood a portion of its excess of urea. The quantity of blood to be abstracted must be a question of judgment, taking away sufficient to accomplish the objects that I have just specified, but not so much as to depress the vital powers.

(2.) Then give a brisk purgative. The usefulness of this medication as a derivative and a means of eliminating the toxic elements which the kidneys have failed to carry off, may be regarded as settled by the clinical experience of the profession. Many different articles are used for this purpose; but, without stopping to discuss them, or to assign my reasons for the preference, I will say that, when, in the intervals between the attacks, the patient swallows readily, I give twenty grains of jalap with ten of calomel. But, if she be comatose, I mix a quarter of a grain of elaterium with a third of a teaspoonful of butter, place it upon the back of the tongue, and it soon slips down. This is to be repeated every half-hour, until free catharsis takes place. In this hospital, our experience is, that the elaterium furnished is not very good, and we generally give it in half-grain doses. Some prefer croton-oil to elaterium. Stimulating purgative enemas are sometimes very useful in hastening the action of the medicine, but, unless

the patient be profoundly comatose, there is danger that, in the administration of the enemata, reflex irritation will be increased, and a renewal of the convulsions provoked. I have more than once seen this result.

(3.) To arrest and prevent the convulsions, administer chloroform by inhalation. Whatever difference of opinion there may be as to the comparative safety of different anæsthetics, I believe that there can be no question that, to control convulsions, chloroform, for many reasons, is to be preferred to any other agent. There are still some men to be found in the profession, who are fearful of using chloroform in these cases, and others who are doubtful as to the amount of good to be attained by its use; but I believe that all observers of large experience as to its effects in these cases, are unanimous in their convictions that this agent has done more than all the other resources known to our art, to diminish the fatality from puerperal convulsions. The inhalation should be suspended during the convulsive attacks, and while there are symptoms of greatly-impeded circulation and respiration. But it should be commenced in full inhalations, whenever symptoms indicate a return of convulsions; and, if the intervals between the attacks be very short, it is necessary to continue the inhalation through the comatose period. The extent to which the anæsthesia is to be carried should be proportioned to the violence and frequency of the convulsions. If the attacks be not severe, and occur at long intervals, the patient should not be kept under the constant influence of the chloroform, but it should be renewed whenever there is the slightest threatening of a new access. But, if the attacks be very severe, with very short intervals, a profound anæsthesia should be induced and kept up for a long time.

I have frequently, under these circumstances, kept patients for five or six hours profoundly under the influence of the chloroform, and I have no doubt that the failure of good results from chloroform, which some have complained of, has often been due to fear of its use to a sufficient degree to accomplish the end in view.

(4.) Having overcome the immediate danger from convulsions, by the means which I have just indicated; viz., venesection, a hydragogue cathartic, and the inhalation of chloroform, the next point is to secure an exemption from the return of the eclampsia, by allaying nervous irritability. For this purpose, I should say, administer hypodermically a full dose of morphia, that is, from ten to twelve drops of a solution of sixteen grains to the ounce of water. I am well aware that many writers have taught that the use of opiates is highly dangerous when convulsions are the result of uræmia. This was the belief of my colleague, the late Dr. Elliot, and I believe that this opinion is strongly held by my colleague in the hospital, Dr. Alonzo Clark. But, having carefully examined the grounds on which this apprehension is based, I am convinced that the alleged danger of inducing fatal narcotism, when renal lesions exist, is chimerical in cases of puerperal convulsions. For eight or ten years past, my teaching and my practice have been in accordance with the rule that I have just given. It is my firm belief that the hypodermic administration of morphia is the most efficient means yet known for allaying that irritation of the spinal system which culminates in convulsions, and that uræmia does not contraindicate the use of this agent. In this opinion I am happy in being supported by my friend, Dr. John T. Metcalfe, who combines, to a rare degree, thera-

peutic knowledge with a therapeutic instinct. I am not aware that his views on this point have ever been published, but, in an incidental conversation with him, a few years since, he expressed, in unqualified terms, his belief in the usefulness and safety of morphia in uræmic convulsions. There is the great advantage, in the treatment of a patient in convulsions, by chloroform and the hypodermic administration of morphia, that both agents can be used when the patient is unconscious and incapable of the voluntary effort of swallowing.[1]

I will remark here, that I had hoped for great results from the use of chloral-hydrate, under the circumstances in which I have advised the hypodermic use of morphia, but I have been disappointed. The therapeutic discovery of Liebreich is one of immense value, and I should hardly know how to do without it in many cases in practice, but my clinical experience has led me to give up its use in puerperal convulsions. I cannot explain the reason, for the chemists tell us that, by decomposition, it becomes chloroform in the system. It certainly does not act therapeutically like chloroform, except that both agents produce sleep; but I am convinced, by observation of many cases, that it does not, like chloroform, allay reflex nervous irritability, and I am strongly suspicious that it excites it. I shall again allude to the chloral-hydrate, in discussing puerperal mania, in which I have found it of great service. But it has not been so in puerperal convulsions. I ought, however, to add that several writers have published

[1] As corroborating the opinions which I have expressed, I refer with great pleasure to an excellent and important paper, by Professor A. L. Loomis, on acute uræmia, published in the *New York Medical Record*, August 1, 1873. Dr. Loomis relies mainly on the hypodermic use of morphia, and the infusion of digitalis, in the treatment of non-puerperal uræmic convulsions.

cases reporting favorable results from the use of chloral in this malady.

(5.) In a certain proportion of cases, all the means that I have enumerated are unavailing to arrest the convulsive attacks. In many cases, the effect of the convulsions is to provoke labor; uterine contractions are excited, and the cervix is found to be dilating. Here, the duty is plain: nothing should be done to retard the labor, but every thing, to advance it.

In other cases, the convulsions continue, and perhaps increase in severity, with persistent dangerous coma in the intervals, while a vaginal examination shows that the cervix is undilated, and that the uterus is making no effort to expel its contents. I think there can be no doubt that it is the duty of the accoucheur to bring on labor, under these circumstances, as soon as possible. The means of accomplishing this result with safety are now much better understood than they were a few years ago.

When convulsions occur during labor, you should first ascertain whether any of the eccentric causes exist, such as improper food in the stomach, constipation, or a distended bladder. If there be indigestible food in the stomach, it should be removed by an emetic of zinc. If the bowels have been constipated, they should at once be freely evacuated. The state of the bladder should be carefully examined, and, if necessary, the catheter should be used. If there be venous turgescence of the face and neck, a flushed face, hot skin, and a strong, full, bounding pulse, venesection should be promptly resorted to. This is a powerful sedative of spinal action, and thus it not only is an important measure to prevent cerebral, but also to cure the spinal disease. When the disease results from stimulation of

the spinal system by excess of blood, or from mechanical pressure of blood on that organ, or from counter-pressure of the distended brain upon the medulla oblongata, bloodletting is often alone sufficient to subdue the disease. It is also equally important to preserve the brain from injury by the convulsion, as the attack may cause such turgidity of the vessels of the head as to result in fatal cerebral congestion or serous or sanguineous effusion.

The measure which I consider as next in importance, is the use of chloroform. It has been supposed by many, that a tendency to cerebral congestion contraindicates the use of chloroform. But, on the contrary, sound reasoning and clinical experience conclusively show, that a tendency to cerebral congestion in parturition is a decided indication for the use of chloroform, as, by its use, the spasmodic contractions of all the voluntary muscles, which contribute so essentially to force the blood to the head, are overcome. The contraction of the platysma myoides, the pressure of which prevents the return of the blood from the head, is also overcome; and lastly, the tendency to spasm of the glottis, which impedes respiration and prevents the passage of venous blood into the lungs, is averted. After inhalation of chloroform, I have repeatedly seen the swollen, flushed face become calm and tranquil, the bounding, frequent pulse become soft and natural, and the patient, who was before restless and irritable, tossing about from one side of the bed to the other, now lying in apparently sweet repose, while the uterine contractions were still going on with the utmost regularity. During labor, I never resort to the hypodermic use of morphia, but rely exclusively on the chloroform to allay the nervous irritation.

I will add a word of caution in relation to the measures to be adopted to hasten delivery. In such a fearful complication of labor as puerperal convulsions, the feeling that, the sooner the labor is completed, the sooner the danger to the mother and child will be over, may sometimes prompt to injudicious measures to terminate the labor. Indeed, we were formerly taught that it was our duty, in all cases of convulsions, to deliver by any means in our power as speedily as possible, and I am convinced that I have, in times past, erred in some cases, from my anxiety to accomplish this result. In the first case of convulsions, the history of which was given you in a former lecture, I was strongly inclined to apply the forceps, long before the child was born, and I visited the patient several times for this purpose. But you will observe that, by the use of chloroform and other means, we had two long intervals, one of which was nearly eight hours, without convulsions, and I feared that the irritation from forced delivery would be greater than the irritation from unaided labor. The child was born alive. I think the principle which should govern us, in such cases, is this: Whenever delivery by art can be effected by less irritation than would be produced by the continuance of the child in the parturient canal, it should be resorted to.

The treatment of puerperal convulsions after labor should be modified by the different condition in which the patient now is. There are no longer the reflex irritations of gestation and parturition, but there is, frequently, a depressed condition of the vital powers, resulting from exhaustion. Hence the necessity of caution in the use of chloroform to control or prevent the convulsions after labor.

The convulsions occurring after labor may be due to causes which existed during gestation and parturition, which were kept in abeyance, either by prophylactic treatment or by the use of chloroform during labor; or to causes developed by labor, as a temporary suspension of the renal functions, and the accumulation of urea in the blood; or to the sudden changes in the circulation following the removal of long-continued pressure on the great abdominal vessels; or to renal or cerebral congestions; or to anæmia of the brain; or to emotional causes. A careful study of the antecedents of the attack and of the actual condition of the patient will generally enable you to form an opinion as to which one or more of these causes have developed the attack, and the treatment can then be judiciously adapted to their removal. If the vascular system be labored and excited, if the pulse be strong and hard, and especially if the woman have lost much less than the usual quantity of blood at the time of delivery, there should be no hesitation in bleeding. The patient you have just seen in this room had fourteen convulsions, the first occurring two hours after delivery, but she had none after venesection.

If the renal functions be suspended, you must act vicariously through the bowels, by giving elaterium, the quickest and most efficient of the hydragogues, following the action of this medicine by such diuretics as the citrate or the acetate of potassa. Then tranquillize the nervous system by morphia hypodermically.

When the patient is anæmic and exhausted, the hydragogues and the diuretics may still be necessary, but I should not use chloroform. In this condition, the morphia may be freely used, keeping the patient well under its influence.

In conclusion, I must call your attention to the rapid improvement which has been made within a few years past in the successful treatment of this fearful malady. Merriman says that Hunter, Lowder, and other teachers, were accustomed to state that one-half the patients attacked with this disease died. The statistics of all the published cases which I could collect in 1855 showed that 32 per cent. of all occurring before and during labor, and 22 per cent. of those after delivery, ended fatally. Braun, of Vienna, reports 12 deaths in 36 cases. From a very able article on "Eclampsie," in the "Nouveau Dictionnaire de Médecine," by M. Emile Bailly, I learn that Professor Pajot, of Paris, observed 12 fatal cases in 26 at the Hôpital Clinique, in the service of Baron Dubois, and M. Bailly, while *chef de clinique* in the same service, noted 6 deaths in 15 eclampsic cases, and in this article he gives a total of 119 cases, from different sources, with 51 deaths; that is, a mortality of 42.85 per cent., or nearly 1 in 2.33. Now, in these cases, I am quite sure that chloroform was very rarely used, and, indeed, I have no evidence that it was used in any case. In the 63 cases at the Dublin Lying-in Hospital, from 1847 to 1854, reported by Johnston and Sinclair, there were 13 deaths, that is, 20 per cent. But these cases occurred in the early days of chloroform, and it must also be mentioned that 44 of the 63 cases were unmarried primiparæ. In a very excellent practical article on the "Treatment of Puerperal Convulsions," by Dr. J. Hall Davis, of London, published in volume xi. of the "Obstetrical Transactions," it is stated that "in the Royal Maternity Charity of London, in which the patients are married women, and the deliveries conducted at their own homes, the Eastern District, as re-

ported by Dr. Ramsbotham, 1820–'50, yielded 43 cases of convulsions, with 3 deaths; that is, a mortality of 1 in 14.3, or 7 per cent. In the Western District, of which Dr. Davis had charge, the deaths from convulsions were 1 in 11, or about 9 per cent. Since 1855, I have had 7 cases in my own private practice, and I have seen 58 others in consultation-practice, not including those which have been in this hospital; and, in these 65 cases, there have been 9 deaths, or a little over 14 per cent.[1] I fully believe, with Dr. Davis, "that this mortality will be still further reduced, as that valuable agent chloroform comes more to be employed in suitable cases for its administration, and other indications are fully recognized."

[1] Since this lecture was prepared for the press, I have seen seven cases of puerperal convulsions, six of which were in consultation, and all of them recovered.

LECTURE VIII.

LACTATION.

Condition of the organs of lactation during gestation—Milk-fever—Prophylaxis—Treatment—Breasts with excess of adipose tissue, but defective in glandular structure—Depressed nipples—Erosions and excoriations—Fissure or crack—Inflammation of the nipple—Eczema of the nipple.

GENTLEMEN: We come now to the second period of puerperal convalescence, during which the function of lactation should be fully developed. It is scarcely necessary for me to tell you that the breasts and nipples are the organs directly connected with this function, and that the preparation for it commences at an early period of pregnancy. During the second and third months, the nipple swells, and becomes more erectile, sensitive, and projecting, and often of a deeper color. Then the skin around the nipple is gradually discolored, varying in depth of shade, intensity of discoloration, and extent of surface, and these changes increase with the progress of gestation. In some women, almost as soon as conception has taken place, the breasts become tender and swollen, and this enlargement is accompanied with prickling sensations, or even positive pains. This swelling sometimes diminishes during the fourth or fifth month, reappearing, larger than before, near the end of gestation. You should also be aware of the fact, that there is a liabil-

ity to two variations from the normal modifications which occur in the breast during pregnancy: First, the functional activity is so exaggerated in a few individuals as to produce fever, analogous to what is called the milk-fever after confinement; and this may even be carried to the extent of producing inflammatory engorgement, terminating in abscess. I have occasionally visited professionally one lady, who suffers more from this cause, in each of her pregnancies, than from every thing else connected with pregnancy and parturition. After her confinement, she has no difficulty in lactation. Second, in some, the breasts at first enlarge, but afterward the tumefaction subsides, and they remain flaccid and soft until after delivery. This is not a good sign, for, according to Donné, women in whom this condition of breasts occurs, prove very poor nurses, on account both of the bad quality and small quantity of their milk; and, in my own experience, I have several times verified the correctness of his assertion. You may remember that, in my lecture on Abortion, I mentioned the decrease in size, and flaccidity of the breasts, as one of the signs of the death of the ovum; but please bear in mind, that this is not a pathognomonic sign of this event, but that it is one of the signs in conjunction with the others that I then enumerated.

The secretion of milk frequently commences as early as the fifth month of pregnancy, and some women are quite annoyed by the running out of the milk in the latter months of gestation.

After delivery, the breasts yield, on suction, a thin watery fluid, of a yellowish color and sweetish taste, which has received the name of colostrum, and is admirably adapted to form the first nourishment of the infant, as it seems to be slightly laxative, and well fitted

to unload the bowels of its viscid, green contents, called meconium. The full development of the function of lactation is not ordinarily attained until forty-eight or seventy hours after delivery, and in some a still longer period is required for this end. In connection with this development, we sometimes meet with a combination of symptoms, which, in their aggregate, have been designated as milk-fever.

Milk-Fever.—It was formerly supposed that milk-fever generally accompanied the secretion of milk; but at the present day, from the great improvement in the hygienic management of those recently confined, especially in securing a period of absolute rest and sleep after delivery, in giving good nourishment, and in applying the child to the breast after the woman has recovered from the exhaustion following labor, milk-fever is an exceptional incident of the puerperal state. I give you the following proof of the correctness of this assertion: In 1867, I had blank forms printed, to be filled up by the house-physician, and kept at the head of the bed of each patient, so that, in my visits, by a glance, I could see what the condition of the patient had been in each twenty-four hours. If any puerperal disease occurs, the pulse, respiration, and temperature, were noted, morning and evening, and, in severe cases, hourly. I here show you a specimen of one report as it is filled up. (See following page.)

Now, I have here fifty-two of these reports for the month of November, signed by Dr. P. R. Cortelyou, house-physician, and only four of these note any symptoms, either of increased frequency of the pulse or a rise in the temperature, indicating milk-fever. I have forty-eight reports, signed by Dr. W. H. Johnston, the house-physician to the lying-in wards for the month of

NAME OF PATIENT.	AGE.	NO. OF CHILDREN.	DATE OF LABOR.	STAGES (DURATION OF)			PRESENTATION AND POSITION.
				1st.	2d.	3d.	
Margaret C——.	28	2	Dec. 18, 9 A. M., to Dec. 18, 2.50 P. M.	h. m. 5 20	25m.	5m.	Vertex. L. O. P.

DAYS.	Respiration.	Pulse.	Temperature.	REMARKS AND TREATMENT. Boy, 7 pounds.
1st.....Dec. 19, 10 A. M.	22	84	100°	Temperature, 100°, two hours after labor.
2d.....Dec. 20, 10 "	24	96	99°	Mag. sol., ℥x and v. viride, ℥v, twice or thrice daily. Quinine, gr. v, twice daily.
3d.....Dec. 21, 10 "	24	92	99.8°	Mag. sol., ℥x and v. viride, ℥v, twice or thrice daily. Quinine, gr. v, twice daily.
4th.....Dec. 22, 10 "	24	96	99.4°	Mag. sol., ℥x and v. viride, ℥v, twice or thrice daily. Quinine, gr. v, twice daily.
5th.....Dec. 23, 10 "	24	92	99.8°	Mag. sol., ℥x and v. viride, ℥v, twice or thrice daily. Quinine, gr. v, twice daily.
6th.....Dec. 24, 10 "	20	84	99°	
7th.....Dec. 25, 10 "	24	72	99°	
8th.....Dec. 26, 10 "	20	80	99°	From this date, the convalescence was rapid and recovery complete.

DR. BARKER, *Obstetric Physician.* W. H. JOHNSTON, *House-Physician.*

December, and four of these cases, also, exhibited moderate symptoms of febrile disturbance, arising from the development of lactation. I must remark here that, during both of these months, there was a strong tendency to septicæmia and puerperal fever from endemic causes in the hospital, and all of our puerperal patients, for the first week after confinement, exhibited a high thermometric range, averaging from 99° to 100° Fahr.

I should say that the prophylactic measures for the prevention of milk-fever are the following:

(1.) Secure to your patient, by every possible means, some hours of sound and refreshing sleep, immediately after delivery. During labor, the vital forces have been stimulated to their maximum of intensity, in order to accomplish the expulsion of the child. A period of complete repose is absolutely essential to prevent more or less violent reaction, which is naturally increased by the development of the new function of lactation.

(2.) Give her such food as will be abundantly nutritious, without overtaxing the digestive organs.

(3.) Apply the child to the breast as soon as the patient has recovered, by rest and sleep, from the exhaustion following labor. Before the breasts are distended by the secretion of milk, the nipple can be more readily seized and drawn out, the flow through the lacteal tubes is more easily secured, the earlier secretion of milk is excited, and, being drawn as fast as it is secreted, the breasts do not ordinarily become overdistended, and the nipple is permanently elongated. The only exception I should make to this rule, is where the woman manifests a strong tendency to sore nipples, or where she has suffered from this after previous confinements. In such cases, I think the child

should be withheld until after the secretion of the milk and an easy flow through the ducts has been established by gentle rubbing of the breasts with warm sweet-oil; for fruitless efforts of the child to draw the breasts may lead to excoriation. Some writers direct that the child should be applied as soon as possible after the delivery of the after-birth, and that the accoucheur should never leave until this has been done; the argument for this rule being, that by this means, and by this means alone, the patient is secured from the danger of post-partum hemorrhage. But, with all due deference to the opinion of others, it seems to me that the cases where this rule should be followed are exceptional. In those cases in which the vital forces have not been exhausted by the labor, we have other methods of securing, by reflex action, the permanent contraction of the uterus, and in those cases in which the hemorrhage has been great, and nerve-power is worn out, the fatigue and excitement induced by the effort to make the infant nurse quite counterbalance the advantages that might result.

In some women, the secretion of milk is inevitably attended by more or less febrile reaction, which the most watchful care will not avert. The symptoms of milk-fever may be tersely described as follows: headache, a flushed face, slightly-furred tongue, thirst and loss of appetite, heat and dryness of the skin, quick pulse, painful and distended breasts, sometimes to such a degree as to embarrass and render painful the respiratory movements. The rise in temperature, as indicated by the thermometer, is ordinarily about one degree, never, from this cause alone, in any case that I have seen, more than a degree and a half.

By judicious treatment, the symptoms of milk-fever are usually overcome in twenty-four or thirty-six hours.

Perhaps you will find the following plan as good as any:

(1.) If the bowels have not been moved freely, give a saline laxative.

(2.) Subdue vascular excitement, and promote diaphoresis. For this purpose, I have found a combination like the following very effective:

℞.	Aq. aurantii flor.,	℥ ij.
	Spts. ether. nit.,	
	Syr. simp.,	āā ℥ j.
	Antimonii et potass. tart.,	gr. ij.
	Tinc. aconit. rad.,	gtts. xx.

M. S. A teaspoonful in a wine-glass of sugar and water every second hour.

(3.) Direct the nurse to gently but thoroughly rub the breasts, from the circumference toward the nipple, with warm sweet-oil, at least every two hours, until the painful distention has subsided. Of course, you will not neglect to have the breasts often drawn, either by a child or a breast-pump, but take care, in doing this, not to permit the nipples or breasts to be irritated.

(4.) Allay pain and nervous irritability, and secure sleep at night, by a diaphoretic anodyne. You may give eight or ten grains of Dover's powder for this purpose, but I am generally better pleased with the effects of the same dose of Tully's powder.

Lactation may be prevented or seriously interfered with by a variety of conditions, of which you should be aware. It sometimes occurs that a woman may have large and handsomely-formed breasts, but there is absolutely no secretion of milk. The mammæ seem to be made up entirely of adipose tissue, lacking the proper glandular development. After judicious measures have been tried, for a sufficient length of time to demonstrate

the impossibility of securing the lacteal secretion, all attempts should be abandoned, as inflammatory action may be excited, which might terminate in mammary abscess. Again, in other cases, the secretion is abundant enough, but it is not retained. It runs out as fast as it is formed, to the great annoyance of the mother, and the serious deprivation of the infant. Very often this running out of the milk lasts for a short time and then gradually ceases; but, when it takes place to the extent of depriving the child of its requisite nourishment, positive treatment is required to arrest this untimely flow. Astringents applied to the nipples have been recommended for this purpose, but I have never seen much good result from such applications. The only effective means to accomplish this is compression of the whole breast, exclusive of the nipple, by strapping it with adhesive plaster for two or three days. The compression should be moderate in degree and equably applied over the whole breast, in such a way as to keep it up, and an incidental benefit from this measure is that it tends to preserve the form of the breasts in their virgin beauty, a result which most women bear with exemplary fortitude.

Depressed Nipples.—The absence of sufficient prominence for the child to seize hold of is sometimes a serious obstacle to nursing. But, by drawing out the nipples with the breast-pump, and the early and frequent application of the child to the breasts before they are distended by the secretion, and by wearing constantly, when the child is not nursing, the breast-shells, as they are called, this difficulty is usually overcome.

Among the most troublesome, painful, and intract-

able of the conditions which interrupt normal lactation, should be mentioned the following:

Sore Nipples.—This term includes a variety of pathological conditions, as erosions and excoriations, inflammation and ulceration, cracks or fissures at the base of the nipple, and eczema, each of which requires a different treatment. From the vague directions found in most of the obstetric text-books in regard to their management, I suppose that many young practitioners have found these among the most perplexing and unsatisfactory of all the minor pathological affections which they are called upon to treat in the puerperal woman. You will find in your standard authors a great variety of remedies mentioned as useful local applications in such cases; but, when called upon to treat them, there is such a lack of every thing like specific and definite direction as to the choice of these remedies in any given case, that, if your experience should be any thing like mine, it will seem to you as if you were compelled to grope in the dark. Without stopping to discuss the value of all the different agents proposed as useful in these cases, I shall only detain you by a concise statement of what my experience has led me to believe is the best method of treatment in each special condition.

Erosion—or, when it is more extensive, called excoriation of the nipple—is a superficial wound of the skin, in which the derm is laid bare by the removal of the epidermis by nursing. Sometimes it produces little vesicles, one or more, on the apex or sides of the nipple, which are broken by sucking, scabs form, which are again and again pulled off, and we have what the nurses call, chapped nipples. From this, results entire destruction of the derm, and we then have ulceration of the

nipple. The surface is then of a bright-red color, granulated, frequently swollen, and grooved in fissures. When such a condition exists, you can readily understand that the act of nursing produces intolerable suffering, to such a degree that patients have often told me that the pains of labor could be more easily endured. I have sometimes seen half of the nipple beveled off by this ulcerative process. But, if you see the case sufficiently early and treat it properly, and the nurse and patient scrupulously follow your directions, the ulcerative process may always be avoided. If the nipple be very sensitive and tender, I find the best application, for preventing erosion and excoriation, is the nitrate of lead, as recommended by Professor Wilson, of Glasgow. I am not in the habit of using it in this hospital, because I fear the nurses and patients may be negligent in washing off the lead, before applying the child. But, in private practice, I very frequently direct this application, and have obtained more satisfactory results, than from any other. The formula is:

℞. Plumbi nitrat.,	grs. x.–xx.
Glycerin.,	℥ j.

After nursing, the nipple should be carefully wiped with a piece of soft linen, and the solution applied freely. It should be carefully washed off before the child is again put to the breast, and reapplied after each nursing. In the early stage of erosion and excoriation, direct that as soon as the child leaves the nipple, it should be very carefully wiped dry with a soft piece of linen, and then painted over, by means of a camel's-hair brush, with the compound tincture of benzoin. Brush it over three or four times, allowing an interval of a minute or two for each application to dry. This forms a kind of

artificial cuticle, which should be renewed each time that the child nurses, and, if it be possible to make the child nurse through it, direct that a nipple-shield should always be used. Very good ones are now kept by our apothecaries generally, but, in selecting one, be careful that its base is sufficiently large and elastic, so as not to strangulate the nipple. The first application of the benzoin produces a little smarting and burning pain for a moment or two, but its renewal is not usually painful. If the ulcerative process have commenced, stop nursing from that nipple. There is no other way; and the more promptly you decide to do this, the more speedily will the nipple be cured, and very frequently it is not necessary to suspend the nursing more than twenty-four or thirty-six hours. Empty the breasts by gentle rubbing only. This can only be done by tact and perseverance, although it sometimes requires ten minutes to get the first few drops. Then paint over the ulcerated surface, twice a day, with a solution of nitrate of silver, gr. x to ℥j of distilled water, and keep the surface covered with carbonate of magnesia, or what I think is still better, calomel.

Fissure, or crack, at the base of the nipple, occasions intense suffering; often, I have thought, quite as severe as the form of sore nipple that I have just described. It sometimes is so small that it can only be seen in a good light by bending the nipple over to the opposite side. To cure this, pencil the bottom of the fissure with a very fine point of the solid stick of nitrate of silver, and then cover it with collodion. If the fissure be not associated with the form of sore nipple that I have before described, or with inflammation of the nipple that I am about to speak of, it is cured speedily by these means.

Inflammation of the nipple is sometimes a cause, and in other cases a consequence, of the preceding conditions, and the inflammation frequently extends to the areola. It is not an unfrequent cause of one form of mammary abscess. The nipple is conical, red, swollen, and excessively painful. Apply a soft bread-and-milk poultice for a few hours, and then keep it covered with one or two thicknesses of linen, wet with a solution of lead and opium:

℞. Aq. rosæ, ℥ iij ss.
Liq. plumbi diacet. dil., ℥ ss.
Ext. opii aq., ʒ j.
M. Ft. lotio.

After the inflammation is so far subdued that nursning can be borne without much pain, the nipple should be very carefully washed before the child is applied, and, after nursing, the following lotion may be used:

℞. Aq. rosæ,
Glycerin., āā ℥ ij.
Acidi tannic., ʒ ij.
M. Ft. lotio.

I have described each of the above forms of sore nipples as distinct affections, but you should not forget that either of the two, or the three forms together, may be associated, when the treatment must be modified or combined according to the special indications.

Eczema of the nipple is a rare, but very troublesome affection, which is sometimes met with in nursing-women. The cases that I have seen have all been of some weeks' or months' duration before they have come under my observation. I have used with great benefit an ointment which I heard Velpeau prescribe many years ago for a case of this kind at *La Charité*, Paris:

℞. Ung. aq. rosæ, ℥ j.
Magnesiæ carb., ℈ ij.
Hydrarg. chlor. mit., ʒ j.

M. You should direct the apothecary to rub it up very thoroughly, or it will be lumpy.

But, undoubtedly, the best advice which I can give you on this affection is a quotation from a letter which I received from Dr. Tilbury Fox, of London, whose authority on affections of this class will be accepted by all.

The directions of Dr. Fox are as follows:

"1. Great cleanliness, and care in washing away any remnants of milk after each time that the child is put to the breast; and, if the nipple be tender and excoriated, use—

"2. A little liquor plumbi and calamine powder as follows:

℞. Liq. plumbi, ʒ j ss.
Pulv. calaminæ præp., ʒ j ss.
Glycerin., ʒ j.
Adeps, ad. ℥ j. M.

"3. I cover over the nipple with a lead nipple-shield. This excludes the air, keeps the part from being chafed, and I think the lead does good after the part has become less red and sore. I often use a little glyceral tannin painted on night and morning.

"The above application can always be removed with a little cold cream and a little warm water, sponging before the child goes to the breast."

LECTURE IX.

MASTITIS AND MAMMARY ABSCESS.

Mastitis more liable to occur during the early weeks of lactation—Literature of the subject—Causes of mastitis—Anatomical seat—Varieties—Diagnosis—Prognosis as to duration—Influence on lactation—Effect on the general health—Treatment of each variety—Mammary abscess sometimes a result of pyæmia, and sometimes one of the eliminative processes in puerperal fever—Mammary neuralgia.

GENTLEMEN: I call your attention to-day to a class of affections, the importance of which can hardly be exaggerated. Inflammation of the breasts and mammary abscess are more liable to be developed during the first four weeks after confinement than at any other period, but they may occur at any time during lactation or gestation. They, sometimes, although much more rarely, are met with, entirely unconnected with either of these states, as I have seen, in the young girl, and even in the new-born infant of both sexes, and this, too, where I had no reason to believe that the breasts had been maltreated by an ignorant or prejudiced nurse, from the absurd belief that the milk in the breasts of the infant must be squeezed out. When inflammation of the breasts and mammary abscess occur during the puerperal state, it is always a deplorable and, sometimes, a very grave and dangerous complication, as, not unfrequently, there is a succession of ab-

scesses, which not only interrupts, but may permanently destroy the functions of the organ; the spirits of the patient are broken, the strength of mind shaken, and the general system is exhausted and, for a time, seriously impaired. You should also know the fact that such cases sometimes terminate fatally, even when under the treatment of the first talent and those of the largest experience in the profession, as for example: Velpeau gives a *résumé* of two hundred cases which occurred in his service, three of which died, one hundred and thirty-nine were cured, in twenty-eight, the cure was incomplete, and the results in the remainder of the cases were unknown. The reputation of the medical attendant, under such circumstances, is also seriously jeopardized, as the popular belief is, that such a train of consequences must be due either to neglect or mismanagement on the part of the monthly nurse or the doctor. And we see the influence of such a belief on the profession in the statements which now and then appear in the medical press, that inflammation may be arrested and abscess prevented by rubbing the breasts, or by the use of belladonna, or by some other special local treatment. Now, all such statements are worse than nonsense; for they are sure to mislead and grievously disappoint those who place any reliance upon them. Whenever you meet with such statements, you may be sure that they emanate from those of little clinical experience, who have deduced general principles from a very limited number of observations. The special literature on this subject is unusually rich, as, in addition to all you find in your obstetrical and surgical text-books, Sir Astley Cooper, the brilliant English surgeon, has written a treatise on the diseases of the breasts, which will long be a classical authority. Velpeau, who held a

corresponding rank among the surgeons of France, published, a few years since, a volume of more than seven hundred pages on this subject, which ought before this to have received an English translation. A very suggestive paper on Mammitis, with an analysis of seventy-two cases, by Mr. T. W. Nunn, Surgeon to the Middlesex Hospital, was read before the Obstetrical Society of London, and published in its Transactions.

Important contributions on this subject may be found scattered through the medical periodicals of this country, and of Europe. I may particularly mention some articles which have appeared in our own journals; as, in the *New York Journal of Medicine*, one by Dr. Conant Foster, formerly physician to this hospital; a report of fourteen cases, by Dr. John G. Johnson, formerly house-surgeon to this hospital; and, in the *American Medical Monthly*, a valuable essay, by my friend Professor Thomas. I give you the principal literature of the subject, because, if any of you should have a perplexing and tedious case of this kind, as may very likely happen to you soon after commencing practice, if you feel the right kind of interest in your cases, and are animated by a true medical spirit, you will be anxious to search out all that is known on the subject. I fear also that you will find that the appropriate treatment adapted to each special indication, and to each special case, is still left somewhat vague and uncertain. In a clinical lecture, you can only anticipate a discussion of the pathology and therapeutics of the subject, and, from the opportunities that I have had to study it practically, both in hospital and private practice, I shall aim to give you, not a recapitulation of what you can read better in the authorities I have mentioned, but to supply, however imperfectly, a want of definite principle

and rule for practice, which I am sure has often been felt.

Causes of Mastitis.—Lactation is by far the most frequent of the predisposing causes. Thus, of Mr. Nunn's 72 cases, 58 occurred during lactation, 7, during pregnancy, and 7, in women neither pregnant nor in lactation. Of the 58 cases during lactation, 57 per cent. occurred during the first two months; during the subsequent seven months, only 14 per cent.; but after the ninth month, 29 per cent. You thus see that over-lactation is also a predisposing cause. Epidemic influence should also be mentioned as a predisposing cause, just as some years we see an epidemic tendency to boils and carbuncles. This was particularly manifest in the fall and winter of 1859–'60, in this city; and, as I learn from the statements of physicians, it was equally so in other parts of the State, and in New England. When I came on duty in this hospital, in October, 1859, there were 14 cases of mammary abscess in the wards. During my service, there were 16 additional cases, while three-fourths of all confined here exhibited more or less tendency to inflammation of the breasts. During my service this winter, I have had the opportunity of showing you but two cases, and those I found here when my service began. I am not aware that any author has mentioned epidemic influence as a predisposing cause, but you see, from the facts that I have just mentioned, that it really is so. If you look at Velpeau's cases, you will see that he had 24, in 1837, and but 4, in 1839. The principal exciting causes are: exposure to cold; inflammation of the nipple, extending to the breasts; repression of the secretion of milk at an early period; obstructed lacteal ducts; bruises, and other external injuries; and emotional causes, as mental disturbances, fright,

etc. The influence of the latter, although frequently overlooked, has been particularly noticed by many authors, and is another illustration of the great importance to the physician, of a thorough appreciation of what is called the *morale* of his patients.

Anatomical Seat.—Inflammation of the breasts may occur in three situations: first, in the subcutaneous areolar tissue; second, in the gland itself; and third, in the areolar tissue between the gland and the thoracic walls; and, as this inflammation frequently—some authors say generally—goes on to suppuration, we have three kinds of mammary abscess; viz., the subcutaneous, the glandular, and the subglandular. Different terms have been used by authors to describe these forms of abscess, but those I have used seem to me the most simple and significant. The inflammation is described by Sir Astley Cooper—and no one since has given a better description—as adhesive in the first stage, suppurative in the second, and ulcerative in the third.

The same laws govern inflammation of these tissues of the breasts, as govern inflammation of the same tissues in other parts of the system, modified only by certain peculiarities of anatomical arrangement of structure. In the first stage, these laws are precisely the same. In the suppurative stage, they are the same, when the inflammation is confined to the subcutaneous areolar tissue: it is a simple phlegmonous inflammation, differing in no way from abscesses of this kind in other situations, except that it is always distinctly circumscribed. The third stage of this form of mammary abscess is also like the same stage in other phlegmonous abscesses, as it opens by ulcerating the tissues from the interior to the exterior; unless, for the purpose of

curing it more speedily, an artificial opening be made by means of the lancet or bistoury.

In the glandular variety, one lobule after another may become inflamed, so that successive abscesses form in different parts of the gland. In the subglandular variety, the pus usually at first finds an exit at the lower and outer side of the gland, but generally it also appears later at other points of the circumference. The apertures through which the pus discharges itself frequently degenerate into fistulous canals, which are often very difficult to cure. Here we have some of the modifications due to peculiarity of arrangement of the anatomical structure. If you look over the published reports of the cases by the authors that I have mentioned, you will find very many in which the succession of abscesses and number of apertures for the discharge of pus, count up to ten, twenty, thirty, and, in one of Velpeau's cases, even to forty-five in the same breast. You can readily conceive how such a train of events will wear out the system, and break down both body and mind. But these are not all of the conditions which may contribute to such a result. The ulcerative process is generally gradual and of a normal kind, that is, preceded by a fibrinous exudation, which protects the adjacent tissues; but not unfrequently in the glandular, and especially the subglandular forms, there is a destructive disorganization of texture, resulting in more or less extensive sloughs. The percentage of such cases is by no means small. The extent of the slough is of course proportionate to the destruction of tissue. In one of the cases reported by Dr. Foster, the slough is described as being as large as a hen's-egg. But this is not all; the destructive ulcerative process may involve the blood-vessels of the part where the ab-

scess is situated, and dangerous and even fatal hemorrhages may result. Professor Miller, of Edinburgh, refers to thirteen such cases, published in different medical periodicals, and he asserts that there are others. The continued destructive ulcerative process will sometimes go on, in spite of the most judicious and best-directed local and constitutional measures; and it has happened that the medical attendant has been accused of causing the recurrent hemorrhages which occur in these cases, by wounding an artery when opening the abscess.

Diagnosis.—While it is of great importance, with reference to the prognosis and treatment, that an accurate diagnosis should be made as to the form of mastitis that we have to encounter, it must not be forgotten that any two or three varieties may be met with, or one variety may be primitive, and one or both of the others may be secondary.

Subcutaneous mastitis presents only the ordinary signs of phlegmonous inflammation of the areolar tissue, which it is unnecessary for me to describe; for I must assume, in a clinical lecture, that you are familiar with the principles of general pathology. If suppuration have taken place, where the abscess points the tegumentary covering becomes thin and of a bluish or a livid color. To detect fluctuation, with one hand, press the breast against the chest, while with the fingers of the other, you palpate the projecting tumor. If there have been circumscribed tumefaction, redness of the surface, a thinning of the skin, and other signs of local inflammation gradually developing for some days, it will hardly be possible for one of ordinary intelligence and acquirement to make a mistake as to the case he has to treat. In this form of inflammation, where ap-

propriate treatment is resorted to, it rarely happens that we have more than one abscess.

The constitutional symptoms attending glandular inflammation are more marked; there is more febrile reaction, and the local pain is much more intense. During the inflammatory stage, there is a nodulated induration, varying in size according to the extent of gland involved, called by nurses a lump in the breast; and the function of lactation is painful, imperfect, and often entirely suspended, so far as the breast involved is concerned. It is this form of mastitis which succeeds lacteal obstruction or engorgement, when either of these exists. The abscesses resulting are frequently multiple, particularly if the gland be irritated by a continued effort to keep up lactation. Velpeau says that he has seen, in the course of two or three months, twenty, twenty-five, thirty-three, forty-six, and, in one case, fifty-two abscesses in the same breast. He regards this form of abscess as much more frequent than either of the others. Suppuration takes place more slowly than in the other forms, where the seat of the inflammation is the areolar tissue, two, three, or four weeks passing before pus is formed, during which the breast is engorged, either partially or completely, and is the seat of profound, lancinating pains.

The subglandular inflammation usually occupies the whole of the areolar tissue at the base of the breast. The surface of the breast is not usually sensitive to the touch or painful, but there is a deep-seated pain, greatly increased by pressure on the whole organ. When suppuration has taken place, the breast presents a smooth, even surface, without lumps, but is often greatly enlarged, sometimes enormously so, with a feeling of great weight and distention, irregular chills and partial per-

spirations. If both the areolar and glandular tissues be inflamed, or one be developed as secondary to the other, there will, of course, be found more or less of the signs characteristic of each combined.

Prognosis.—This must include questions, not only as to the duration of the disease, that is, the time required for its cure, but the effect upon the general health, the probable recovery, the possibility of continuing lactation in the affected breast, and the subsequent capacity of the organ for its functional duties.

First, as to duration. This will depend in a great measure upon the seat and type of the inflammation, and the character of the abscess, as well as the condition of the general system. The inflammation of the subcutaneous areolar tissue may terminate either by resolution or by suppuration, and either result is attained much more rapidly than it is where the glandular structure is involved. Unless appropriately treated at an early stage, it almost always ends in suppuration, which usually takes place within a week or ten days. Even when resolution is secured, there is apt to remain some induration of the tissue involved, and a slight cause will be sufficient to reawaken the inflammation. The subcutaneous abscess is usually cured within a week or ten days after it is opened. It is very rare that this form of abscess lasts two or three weeks.

The existence of inflammation of the subglandular areolar tissue can very seldom be positively determined, until after suppuration has taken place, and, even if it be suspected, very little can be done by treatment to prevent such a termination. For this and other obvious anatomical reasons, the duration of the subglandular abscess is much longer than of the subcutaneous. Inflammation here exhibits a marked tendency

to become diffuse, while, in the former case, it is ordinarily circumscribed. Even if it be circumscribed, and the pus be formed near the centre of the gland, it is very difficult to ascertain its existence, and thus secure an early discharge by an artificial opening with the knife. If left to come to the surface spontaneously, the pus not unfrequently finds an exit through several channels, and results in those intractable fistulas to which I have before alluded. Again, inflammation of the parenchymatous structure of the organ is very liable to be developed as a secondary affection. So, if you look over the published reports of cases of this kind, you will see that they are apt to last two or three months, and sometimes longer.

The duration of the glandular inflammation is usually much longer than that of the superficial or deep areolar tissue of the breast. Its march is much less rapid, suppuration takes place more slowly, and there remains an induration which requires a long time to disappear. It may attack one or more lobules at first, and, while these are passing through the process of suppuration, contiguous lobules become inflamed, and thus we may have a succession of abscesses lasting for months. A prudent physician will be very guarded in his prognosis as to the duration of this kind of mastitis, as it is very variable, and must depend upon the number of lobules successively involved. To use Velpeau's illustration, suppose that the second abscess does not open until a week from the first, the third a week from the second, and so on, it is evident that when fifteen, twenty, or thirty abscesses are developed, as has frequently happened, the poor woman must be a suffering victim for months. One of Velpeau's cases lasted for eight months, another, six, several, three. Indeed,

Velpeau says that from two to three months is the usual duration of this form of mastitis. The cases reported by other authors confirm this opinion. So, gentlemen, if you conscientiously study your cases, and are fully informed as to all that is known in regard to the laws of the disease, its progress, result, and treatment, and have exercised a sound judgment in the application of your knowledge, you need feel no self-reproach for results which are common to those of the largest clinical experience, and acknowledged practical talent.

The next question that arises is, as to the influence of mastitis on lactation. The answer will depend upon the tissue involved, and the extent and termination of the inflammation. Circumscribed inflammation of the areolar tissue, whether superficial or deep-seated, when the glandular structure is not implicated, may not arrest lactation, even if it terminate in abscess. Lactation may, indeed, be temporarily interrupted, and afterward completely restored. When the inflammation is diffuse, and the pus is discharged by several openings, the secretion of milk is usually arrested. This may be partly due to the extent of the inflammation, and may be partly owing to the necessary treatment of the case. But, in these cases, the subsequent functional capacity of the organ is not impaired, unless more or less sloughing of tissue has occurred, and, as a consequence, such cicatricial adhesions as must necessarily involve the lacteal ducts and the glandular structure of the organ. I have found the impression general with monthly nurses and with patients, that if a breast be broken, as they call it, it will ever after remain useless as an organ of lactation. But you see that is not necessarily the case. It is the exceptional result in subcutaneous and subglandular abscesses, and is by no means a universal result of glan-

dular abscesses. In the latter, it depends upon the amount of glandular structure involved. I have seen lactation restored and nursing resumed, in many cases, after the cure of glandular abscess. But where there is a succession of this form of abscesses, so much structural lesion is produced as permanently to destroy the functional capacity of the organ. Hence, I have seen quite a number of women in whom one breast has been compelled to do the duty of both.

As regards the general health of the patient, mammary abscess is always a serious and deplorable complication. Most patients recover their health eventually, but Velpeau, Burns, and others, have reported cases where the result was fatal. I have never known a case to terminate in death, but I have seen more than one where I have been very apprehensive as to the result. You can all understand what sad inroads may be made upon the constitution by numerous sinuses and large purulent cavities. The patient has repeated chills, followed by fever and exhausting perspirations. There is generally entire loss of appetite, amounting to a loathing of food, frequent nausea, and vomiting of bile, and often diarrhœa. The pulse is frequent and gradually becomes more feeble. The patient emaciates rapidly, the nervous system becomes excessively irritable, the spirits despondent, the mind weakened, and sometimes the brain is seriously disturbed. I know of no affections which produce such mental despondency, unless it be some connected with the organs of generation. Dr. Thomas says, sometimes the patient becomes furiously delirious, and the symptoms would lead to a diagnosis of puerperal mania, when this slight collection of pus is the cause of the mental aberration. I have seen such a case, and readily accept the proposition; and Ramsbotham relates

a case which confirms the statement. Now, if we thoroughly appreciate the gravity of the disease that comes under our care, we shall feel the necessity of perfectly understanding its appropriate treatment.

Treatment.—I shall aim to give you minute, special directions, not only in regard to the management of each form of mastitis, but also for each special condition which may arise, because it seems to me that most young practitioners will find the directions given by authors, in many particulars, vague, indefinite, and unsatisfactory, and because there is still a difference of views in some points of practice.

First, then, in regard to the subcutaneous form, it is to be treated exactly as you would treat phlegmonous inflammation in other parts. You must, however, remember that inflammation is usually (not always) of an asthenic character, and, consequently, antiphlogistic means of an active character are not admissible. I trust all of you have read or will read Paget's "Lectures on Inflammation," and, if so, you will see how improper, oftentimes, antiphlogistics are in suppurative inflammation. Well, then, if there be strong febrile reaction and a high degree of vascular excitement, you will give a diaphoretic sedative, such as aconite. To allay pain and procure sleep, at night, give eight or ten grains of Tully's powder or of Dover's powder. Sometimes, you will find it well to add to the powder a couple of grains of calomel, and to give the next morning a Seidlitz powder or a bottle of the solution of citrate of magnesia. When there is an epidemic or endemic[1] tendency to this form of suppurative inflamma-

[1] In visiting the convalescent wards of the puerperal patients in Bellevue Hospital, on Monday, March 10, 1862, I found five women with subcutaneous mammary abscess. These were all, undoubtedly, due to an endemic cause; viz., the impure air of the ward.

tion, you will avoid such agents as the aconite and others which depress the system, but, instead, give your patients quinine, in as full doses as the system will tolerate. By the use of this, you will often prevent suppuration, as I have frequently demonstrated, both in the hospital and in private practice. As for the local treatment, an abscess may frequently be aborted, if you see the case sufficiently early, by freely painting over the inflamed surface with iodine, just as you may abort a boil or carbuncle. But, in order that this treatment should prove successful, I think the application should be made within twenty-four hours of the commencement of the inflammatory process. As in other phlegmonous inflammations, warmth and moisture are of the greatest service in relaxing the tension, favoring the effusion, and thus relieving the over-distended vessels. You apply this by means of either a bread-and-milk or linseed-meal poultice, as hot as it can be borne, or, what I generally prefer, by water-dressings, that is, two folds of lint soaked in warm water, and covered over with oiled silk, which should extend all around, much beyond the lint. In this form of mastitis, as also in the subglandular form, rubbing the breasts, which, with some, seems to be a routine practice, is absolutely pernicious. A moment's reflection will convince you that it must be so; and yet I have been often surprised to see how carelessly it is prescribed. So, also, in these cases, the application of belladonna is entirely useless, except as it relieves pain. As soon as the abscess points, and the fluctuation can be detected, it should be opened in the most dependent point, but carefully avoiding the areola, as, if it be opened here, the cicatrix may produce retraction of the nipple, and thus prevent the use of the breast after sub-

sequent labors. If my patients have a great horror of the lancet, while I tell them that they will probably be saved two or three days' suffering, and the cure will be effected two or three days sooner by opening the abscess, I do not insist upon it in the subcutaneous variety, as I do in the glandular and subglandular; for, in the latter, serious consequences may result from a neglect to do so. The poultices should be continued until the abscess is emptied. But be careful not to apply them too long. The breast should always be well supported. If the induration remain after the abscess is healed, compression, either by adhesive plaster or by the compressed sponge, should then be applied. I shall discuss this point fully in connection with the other forms of abscess.

In the treatment of the subglandular form of mastitis, the same general principles should govern us, as to constitutional measures, as in the subcutaneous variety. Either sedatives, anodynes, laxatives, or tonics, like quinine, may be indicated, and the indications are too plain to be mistaken by any but the merest routinist. But little can be anticipated from any topical treatment. Rubbing the breasts, for reasons already given, will be worse than useless. The application of the extract of belladonna will do little to mitigate the pain, and nothing to prevent the formation of pus, while its offensive odor is a strong objection against its use, unless we are certain to do good by it. Furthermore, if, as is now generally supposed, it has a direct influence in arresting the lacteal secretion, it may do positive harm, because otherwise this function might be preserved. So, too, compression by any means is not to be thought of, and for the following reason: The purulent accumulation is between the breast and the chest, and

it seeks an exit at the surface. The most favorable point for this is at the inferior circumference of the gland. But, if compression be used, it may result in the formation of several sinuses at the circumference, or the ulcerative process may be developed in the areolar tissue, between the lobules of the gland, and subcutaneous abscess may appear as secondary to the subglandular. Indeed, several subcutaneous abscesses may result from one purulent cavity between the gland and the chest. While these occasionally are spontaneous results, it is certain that compression, especially if it be effected by the compressed sponge, as recommended by Dr. Foster, must favor such results, as, in the latter case, we have compression and a poultice combined. Poultices in this form of mastitis can have no influence in promoting resolution or advancing suppuration. Their sole effect must be to soften the tegumentary covering, and they may, for this reason, cause the pus to come to the surface at one or more unfavorable points. So I never use them in these cases. The sole remedial measure of value is, to secure the early discharge of the pus by incision. If the conditions of the case will admit of an election, the opening should be made at some inferior point in the circumference of the breast, so as to prevent secondary inflammation of the glandular structure or of the subcutaneous areolar structure. Sometimes, where the signs of subglandular abscess existed, but no fluctuation could be detected, I have cleared up all doubts, by lifting up the gland from the thorax, and passing between them an exploring needle. If pus were found in the canula, I have then made a sufficiently large incision with a long tenotomy-knife, and these cases have been rapidly cured. But if the abscess point on the anterior surface, then the opening must be made where

the fluctuation exists, and care must be taken to prevent its closure before the pus is all discharged, by the insertion of a tent. After a few days, compression should be used, leaving the sinus open, for the purpose of completely evacuating the purulent cavity, and promoting adhesion of its walls.

Glandular inflammation, or mammary adenitis, if you prefer to use the less simple term, presents two types. In the one, the different stages of the inflammatory process succeed each other with great rapidity. If resolution be not obtained, suppuration and cicatrization require but a comparatively short time. Thus, among the cases of Velpeau, you will find one, in which several lobules were involved, terminating in abscess, but completely cured in nineteen days. Another case of multiple lobular abscess was entirely well in a month. All practitioners of any experience have met with such, and these are undoubtedly the cases which have led some writers for medical journals to believe that some special treatment peculiar to themselves is a great advance upon every thing before known. But in the other type, the different phenomena of inflammation are slowly developed, and the corresponding symptoms are much less intense; and you see, therefore, cases reported by Dr. Foster, Dr. Johnson, Velpeau, and many others, running on for two, three, or four months, and sometimes for six or eight months. The first class generally occurs in those of vigorous constitution, active circulation, cheerful temperament, and happy nervous organi zation. The second is most frequently met with in those of a lymphatic temperament, an irritable nervous system, low vital powers, and a despondent *morale*.

In the first class you will readily see that vascular sedatives, saline laxatives, anodynes, and an anti-

phlogistic regimen, will be required, while in the other class, as nutritious a diet as the stomach will take care of, stimulants, such as ale, wine, or brandy, tonics such as quinine and iron, and opiates, will be indicated. I take it that it is unnecessary for me to say more than this in regard to the constitutional treatment. The local measures demand a much more extended discussion. First, then, primitive glandular inflammation is almost invariably preceded or accompanied by obstruction of the lacteal ducts, or lacteal engorgement, as it is termed. Inflammation seems for a time to increase the functional activity of the organ, in some cases, while, on the other hand, lactation aggravates the inflammation, and increases the tendency to the formation of pus. Nursing, therefore, should be forbidden, as the pain and excitement produced by the infant at the breast must act unfavorably upon the inflammatory process; but if the lacteal secretion appear to continue with activity, the breast must be disgorged by artificial means. This can be best effected by rubbing the breast gently but perseveringly, from the circumference to the nipple, the hand being lubricated with sweet-oil. The rubbing should be continued until the breast is soft, and all nodulated indurations have disappeared, and for one or two days this process should be frequently repeated. This is a method which has long been adopted in the Dublin lying-in Hospital, and is warmly recommended both by Dr. Foster and Dr. Thomas; and, from a large experience, I am able to fully indorse all that they have said in regard to its value. Then, the next question is, as to the best means of preventing the return of the lacteal engorgement. Camphor is generally believed to exert a specific influence in diminishing the lacteal secretion; and some have therefore

recommended the camphor-liniment, others, a saturated solution of camphor in glycerine, to be used instead of olive-oil.

I prefer the olive-oil for rubbing the breast; and then cover it with the extract of belladonna, softened with a little glycerine. Sometimes I direct that the breast be kept covered with a cloth on which the extract of belladonna has been spread, leaving a hole for the nipple. Belladonna not only relieves the pain resulting from the tension of the tissues, but, from its power of relaxing muscular fibre, it seems to allow a more free exit of the milk, by dilating the lactiferous tubes; and, within a few years past, it has been believed to possess the property of arresting the lacteal secretion. But of this I am certain; that it is a most valuable application to the breast, in glandular mastitis, and I have used it for this purpose (and have also applied it to the leg in phlegmasia dolens), for more than twenty years. I received this hint from Dewees, who professes to have obtained it from Ranque. If these means do not secure resolution, it only remains to open the abscess when suppuration has taken place. The opening should be large enough to allow all of the pus to freely and easily escape.

The next remedial measure, having for its object the relief of engorgement of other lobules, the removal of induration, the prevention of purulent infiltration into the adjacent areolar tissue, and the formation of obstinate fistulous sinuses, is compression. This should be applied so as to support the breast and firmly compress it, from the circumference to the centre, without closing the aperture for the escape of pus; and it is usually best effected by means of adhesive plaster. There are several modes of applying adhesive strips,

described by different authors, either of which may be preferable to all others in certain cases. I shall not stop to describe each of these methods, as none of them are adapted to all cases, and some are open to this objection, that they seriously interfere with respiration. It is impossible to lay down a definite rule for the application of the adhesive strips, because the breast differs so much in different women, in size, shape, form, and position of attachment on the chest. I shall only give you this general rule—apply the straps so as not to impede respiration, but in a way to support the breast, and firmly and equally compress all its parts from the circumference to the nipple, leaving the latter free, and also an opening for the escape of the pus, where the discharge has taken place. Your success in securing these results will depend upon individual tact, and, if you have not that, no rules will supply its place.

With regard to compressed sponge as a means of compression, I shall only say that I have seen it of great service where warmth, pressure, and moisture are all required, to promote resolution of glandular inflammation. But it strikes me as liable to two objections in open abscess: First, the sponge absorbs and retains the discharged pus, which, in a short time, becomes decomposed, and is extremely offensive; and second, the rollers applied around the body, to secure the compression, must interfere somewhat with respiration, and, if the compression is to be kept up any length of time, this becomes a serious objection.

I have said nothing about the use of stimulating injections, such as the tincture of iodine, the solution of sulphate of zinc, or sulphate of copper, to cure obstinate fistulous sinuses, because I have no experience

in their use, having never met with a case which was not readily cured by compression.

Before closing my remarks on abscess of the breast, I must not neglect to mention that purulent deposits not unfrequently take place in the breast, as a result of pyæmia, septicæmia, or puerperal fever, and this is to be regarded as rather a favorable symptom, as I shall explain when discussing these diseases.

Mammary Neuralgia.—I shall say a few words on this affection, as preventing lactation, since I do not remember to have seen any allusion to it by any author. I have, however, met with a few cases, where nursing produced such intense agony as to compel the poor sufferer to abandon it, although not the slightest disease either of the nipple or the breast could be discovered by the most careful examination. In the cases which I have seen, this symptom has not been developed until two or three weeks after nursing has been commenced. There was not the slightest pain or tenderness, except when the child was at the breast, neither could the pain be produced by any manipulation of the organ. In one patient, the nursing of one breast produced intense neuralgia in both. In the first few cases that I saw, I could do nothing, either by local or constitutional treatment, and the patients were compelled to give up nursing. But those which I have seen within a few years past have been cured by quinine, given in as full doses, twice a day, as the patient could tolerate.

LECTURE X.

PUERPERAL MANIA.

Cases—Frequency in this hospital—Comparative frequency in other hospitals—Percentage of insanity in women from this cause—The loose use of the term puerperal mania, including insanity of pregnancy and insanity of lactation—Insanity of pregnancy—Delirium of labor—Illustrative case—Insanity of lactation—Puerperal mania—Mania—Melancholia—The former much the more frequent—Symptoms—Threatening an attack—During the access—Complication with latent inflammations—Prognosis—Duration of the mania—Mental and bodily recovery—Causes—Predisposing—Mental emotions the great exciting cause—Albuminuria not an exciting cause—Treatment—Leading indications: (1) to restore exhausted nerve-power—By nutrition, tonics, sleep—Chloral-hydrate—The effect of chloral-hydrate and chloroform contrasted—(2) to combat all complications—Illustrative case—Moral treatment—Removal to an asylum.

"CASE XI.[1]—Mary ——, aged twenty-nine years, born in England, married, entered Bellevue October 5th, primipara; menstruated last, January 28th. Labor commenced 2 A. M., October 8th, first stage, ten hours; second stage, three and a half hours; third stage, twenty minutes. The child, male, weighed nine and a half pounds. Patient was very anæmic, but lost very little blood at the time of labor.

"*October 9th.*—Pulse 84, respiration 18, temperature 99°.

" *October 10th.*—Pulse 80, respiration 20, temperature 98.5°.

"*October 11th.*—Pulse 84, respiration 20, temperature 98°, breasts full. Took two laxative pills, which moved freely twice, without pain.

"*October 12th.*—Pulse 88, respiration 20, temperature 98.5°. Has a large supply of milk; nurses, by her request, another child beside her own.

[1] Reported by the house-physician, who neglected to sign his name to the report.

"*October* 13*th*.—7 A. M., pulse 112, respiration 28, temperature 99°. Patient answers questions in an excited way; stares wildly, eyes very red, but face pale; says the other women in the ward kept her awake, and were talking all night about her. Lochia natural and without odor. 5 P. M., pulse 120, respiration 30, temperature 99.5°. Signs from auscultation and percussion negative. Urinary secretion abundant; no albumen; has been examined every day. No pain or tenderness over the uterus, which is well contracted down in the pelvic cavity. Ordered morphiæ sulph., one-fourth grain.

"*October* 14*th*.—Patient became so violent in the night that it was necessary to remove her from the ward and to place her in a cell. She talks incessantly and incoherently, using most profane and obscene language. Refuses to nurse her child. 2 P. M., seen by Dr. Barker. Pulse 120, respiration 36. Patient so violent and restless, that it was impossible to get the temperature. Ordered beef-soup every three hours, and, immediately after, quiniæ sulph., gr. ij, tinc. ferri muriat., gtts. xv. As patient had for some twenty-four hours absolutely refused to nurse her child, the breasts were very much swollen and hard; the following to be well rubbed over them: ℞. Ext. belladonnæ, ℥ j, glycerine, ʒ ij. M. At eleven o'clock, to have chloral-hydrat. grs. xxx.

"*October* 15*th*.—Patient is reported to have slept several hours, is very much less violent, but talks incoherently. Answers no questions. Pulse 108, respiration 24. On attempting to use the thermometer, she was apparently frightened, and immediately became very excited. The same treatment to be continued.

"*October* 16*th*.—Slept a good deal during the night, is much more quiet in her movements, and is very silent generally, but at long intervals talks with great volubility and incoherency. Respiration 28, pulse 112, temperature not obtained. Her condition remained very much the same for the three following days, except that her movements were more strikingly lascivious. Says that she is Mary Magdalen, and calls her nurse sometimes Martha, and at other times Lazarus.

"*October* 20*th*.—Very quiet, disposed to weep, answers questions. Asks to have the "nasty stuff" taken off her breasts. Pulse 108, respiration 24, temperature 99°. Removed back to the wards. Chloral-hydrate reduced to grs. xx. at bedtime.

"*October* 21*st*.—Very quiet, taciturn, but occasionally strange. Asked, for the first time, for her child. Cried bitterly when she

found the child could get no milk. Wishes to keep it at her breast the whole time. Has revealed to-day, for the first time, that her husband deserted her and left for Colorado with another woman, six weeks before she came into the hospital. From this date, she steadily improved. The milk returned to the breast, and she left the hospital to fill a situation as wet-nurse.

"CASE XII.[1]—Julia H., aged twenty-two years, single, born in Ireland, pregnant first time. Menstruated last in March, 1871. During the latter part of pregnancy, had some swelling of the feet and labia, but chemical examination of the urine, negative. Was admitted to the hospital only the day before labor began. Labor began 7 A. M., November 9th. First stage fourteen hours. Position L. O. A. Second stage, two hours and five minutes. Pains were only moderately severe, but the patient was very nervous and excitable, and seemed to suffer a good deal. Was delivered of a healthy girl, weighing six pounds, fourteen ounces, a few minutes after 11 P. M. Placenta came away ten minutes after delivery of the child. The uterus contracted well, and patient passed a quiet night.

"*Nov.* 10.—A. M., respiration 24, pulse 68, temperature 100.5°.
P. M., " 27, " 64, " 100.5°.
Complains of pain and soreness in the chest; occasional pains in the pelvic region. Ordered Magendie's solution of morphia, gtts. x.

"*Nov.* 11.—A. M., respiration 26, pulse 76, temperature 100°. Had a chill, beginning at 12 M., which lasted two hours, followed by high fever and sweating. During chill, complained of pain in the lower part of the back and abdomen.

"7 P. M.—Respiration 32, pulse 148, temperature 104°. No sweating, no pain, except when she moves. Slight tenderness in inguinal region. Breasts swelling, no tympanites. Ordered tincture aconite, gtts. iij, every hour, until three doses have been taken. Quiniæ sulph., grs. v, every third hour.

"*Nov.* 12.—9 A. M., respiration 32, pulse 104, temperature 105°.
12 M., " 32, " 108, " 105°.
3 P. M., " 30, " 108, " 104.7°.
9 P. M., " 30, " 132, " 104°.
No pain or tenderness in abdomen. Occasional pain in back, running down the legs.

"*Nov.* 13.—A. M., respiration 32, pulse 112, temperature 105°.
7 P. M., " 32, " 100, " 101°.

[1] Reported by John A. McCreery, A. M., M. D., house-physician to Bellevue Hospital.

Aconite stopped, continue quinine. Patient feels much better. Has a little milk in the breast this evening for the first time.

"*Nov.* 14.—A. M., respiration 28, pulse 84, temperature 101.5°.
P. M., " 30, " 112, " 103.7°.
Has a little cough and some soreness of the chest, with a little pain in the lower part of the abdomen when she coughs. Some tympanites. Ordered Magendie's sol. of morph., gtts. xx, and turpentine-stupes to abdomen.

"*Nov.* 15.—A. M., respiration 25, pulse 84, temperature 101.3°.
P. M., " 24, " 96, " 102.5°.
No pain, very little tenderness. As bowels have not moved for two days, ordered a laxative.

"*Nov.* 16.—A. M., respiration 30, pulse 96, temperature 104.3°.
P. M., " 30, " 104, " 103.5°.
Nervous and excited, no pain, bowels moved, tongue cleaner.

"*Nov.* 17.—A. M., respiration 30, pulse 96, temperature 102°.
P. M., " 30, " 109, " 104.5°.
Patient very excited. Has some pain in the stomach and over the uterus. Vaginal examination reveals tenderness on both sides of the uterus, but no swelling or hardness. Quinine, grs. v, every third hour. Poultices to abdomen.

P. M.—Patient very wild. Has been nervous and hysterical ever since her confinement. Has been suffering great mental anxiety for fear that her misfortune would be known. Yesterday a friend visited her in the hospital, and told her that her seducer was married. Since then she has acted very strangely, at one time crying bitterly, then begging the nurse not to heed her, and then again becoming very violent, with delusions as to her identity. Bowels open. Potass. bromidi, ʒ ss, at bedtime.

"*Nov.* 18.—A. M., respiration 30, pulse 84, temperature 100.5°.
P. M., " 26, " 96, " 103.5°.
Patient more quiet, with less delusions, but still very excitable. Slept most of the night. No pain.

"P. M.—Complains of pain and tenderness over the hypogastric region. Ordered poultice to the abdomen and a suppository of ext. opii aq., gr. j.

"*Nov.* 19.—A. M., respiration 30, pulse 96, temperature 101.5°.
P. M., " 34, " 112, " 104.5°.
Patient rational. Pain and soreness in the right iliac region.

"P. M.—Ordered tinct. aconiti rad., gtts. ij, every second hour.

"*Nov.* 20.—A. M., respiration 30, pulse 72, temperature 99°. Patient feels better. Aconite stopped.

"P. M.—Respiration 36, pulse 96, temperature 102.7°. Patient very nervous. Says she did not sleep last night. Pain, tenderness, and some tympanites of the abdomen. Turpentine-stupes, and chloral-hydrat. grs. xxx.

"From this date until the 25th, the condition of the patient did not essentially change. She slept well under the influence of the chloral-hydrat.

"*Nov.* 25.—Respiration 22, pulse 88, temperature 97.8°. Patient feels well. No pains, and appetite good. She subsequently left the hospital perfectly well."

Gentlemen: The cases you have just seen belong to a class which occurs very frequently in this hospital, or to quote from the "Obstetric Clinic" of Professor Elliot: "In Bellevue we receive a great many cases of puerperal mania, on account of the fact that so large a proportion of our pregnant women are unmarried primiparæ, and because others of the poorest classes, who cannot be controlled at home, are sent to the hospital."

Since I have been connected with this hospital, now seventeen years, I have had one or more cases of this malady, every time I have been on service, with but one exception. In the autumn of 1861, the first year of our late war, I had five cases of puerperal mania; in the spring of 1862, three; in the autumn of 1863, following the great riots in this city, I had six cases; and during my present service (November and December, 1870) I have had three. I estimate the ratio of puerperal mania to the whole number of cases of labor to be one in eighty in this hospital.

I beg you to notice the wonderful contrast in frequency of this malady here, as compared with the statistics of hospitals in other parts of the world. Scanzoni states that in Würzburg, in forty-six years,

there were five cases of puerperal mania out of 7,438 confinements, that is, 1 in 1,487. He also states that the records of Prague, from 1835 to 1848, show that, in 23,347 cases of labor, there were 19 instances of puerperal mania, 1 in 1,228.

In the lying-in wards of St. Giles's Infirmary, one series of cases gives 1 case of puerperal mania in 1,888 of labor, and another series, 1 in 950. McClintock and Hardy, in 6,634 cases of labor, give 8 cases of puerperal mania, 1 in 816. Johnston and Sinclair (Dublin Lying-in Hospital), 26 cases of mania in 13,748 of labor, 1 in 528. At the Westminster General Lying-in Hospital, there were 9 cases in 3,500 of labor, or 1 in 383. At Queen Charlotte's Lying-in Hospital, there were 11 in 2,000, or 1 of mania in 182 of labor.

Now, let us look at the statistics of this disease from another point of view.

Marcé, who has written in some respects the most complete essay on this subject that has yet appeared, finds that the records of "Public Institutions for the Insane" show that about eight per cent. of the insane cases are due to puerperal causes.

The statistics of Scanzoni, taken also from public institutions, some being the same as those of Marcé, also furnish a percentage of about seven per cent., resulting from puerperal causes.

Dr. J. B. Tuke, whose valuable papers on the statistics of puerperal insanity, published in the *Edinburgh Medical Journal*, in 1865 and 1867, are the most suggestive of any thing that I have read on the subject, gives the following statement: "Between January 1, 1846, and December 31, 1864, there were 2,181 female cases of insanity treated in the Royal Edinburgh Asylum;" of these, 155 were so-called puerperal cases, mak-

ing a percentage of 7.1. You see that there is a remarkable agreement of authorities in regard to the proportion of insanity from puerperal causes, compared with all other causes, as shown by the statistics of public institutions.

Another point, not to be overlooked, is that, in private practice, probably one-half of the patients recover from this malady, without entering a public institution. My own experience would lead me to suppose the proportion to be much greater than this. At all events, I think it may reasonably be assumed as proven, that fully seven per cent. of the insanity which occurs among women, in civilized and Christian communities that support insane hospitals, are due to causes connected with child-bearing.

Let me say here that the term puerperal mania is ordinarily used very loosely. Dr. Tuke, in the papers that I have just alluded to, remarks with truth and great force: "In works on midwifery and mental diseases, we find the several forms of insanity which occur during pregnancy, follow parturition, and supervene on lactation, all arranged under the common head of puerperal mania. This, with regard to the first and third divisions, is of course a misnomer, a contradiction in terms; and it seems rather curious that it should have been so long adhered to, more particularly as it tends to confuse and almost stultify deductions made from the few statistics of puerperal mania of which we are possessed. For instance, any comparison, drawn between any given number of labors and any given number of so-called puerperal cases, must lead to erroneous conclusions, if the insanity of pregnancy is confounded with puerperal mania, or if, as is the case, the anæmic insanity of lactation is confounded with either."

The 155 cases of Dr. Tuke are classified by him as follows:

Insanity of pregnancy	28
Puerperal insanity	73
Insanity of lactation	54

The first group, insanity of pregnancy, thus bears a percentage of 18.06 to the total of 155; the second, puerperal insanity proper, 47.09; and the third, insanity of lactation, 34.08.

The insanity of pregnancy and the insanity of lactation are more frequently met with by the alienists and the physicians to insane hospitals, than by the obstetrician proper; and, although my remarks will be chiefly confined to the subject of puerperal mania, I shall say a few words in relation to each of these forms, and also another form, the delirium of labor.

Insanity of Pregnancy.—It is a matter of common observation that, in women of certain temperaments, habits, and education, pregnancy so modifies the nervous system as to produce morbid appetites, changes of temper and disposition, sometimes moral perversion, unnatural sadness, or a settled conviction of impending death.

The diseases of the female sexual organs often produce these reflex disturbances to such a degree as to cause real insanity; and, as it is important for all of you who are to have the responsibility of the health and happiness of the families committed to your charge to understand this, I shall take the present opportunity to say a few words on this too-neglected subject.[1]

. . . . . .

[1] A portion of this lecture, "On Insanity caused by the Diseases of the Female Sexual Organs," was published in the Boston *Gynæcological Journal*, May, 1872.

Pregnancy is a physiological process; and the instances in which the reflex disturbances from this condition result in insanity must be rare. I have seen but two such cases, and in both, the evidence of hereditary predisposition was conclusive. One of them had repeated attacks of epilepsy, the first year of her menstrual life, and the other had been previously insane, but was supposed to have entirely recovered more than two years before her marriage. In both cases, the insanity was permanent. I am indebted to others, and especially to Dr. Tuke, for what I have to say in regard to this form of insanity.

Esquirol found hereditary predisposition in more than one-third of the cases that came under his observation (5 in 13). Dr. Tuke's statistics show that primiparæ are by far the most liable to this malady, "a circumstance which might have been expected when we take into consideration the moral exciting causes, anxiety, and dread of the coming event, which exist to a greater degree in the inexperienced woman." The type of the disease is almost invariably melancholia. In the 28 cases of Dr. Tuke, only 2 are reported as characterized by mania, and he believes that, in those rare instances where mania occurs, it will be found that the patient has previously been the subject of insanity in that form.

In no form of insanity is the suicidal tendency so well marked as in the melancholia of pregnancy. In the earlier stages, it seems very amenable to treatment. Cases are on record in which the insanity of pregnancy is said to have disappeared with labor, but this does not seem to be a common result. If the mental symptoms disappear before or at the time of confinement, there is a marked tendency to recurrence for a

longer or shorter period. These cases seem to be particularly benefited by treatment in the special hospitals for insane, as the assurance of protection, the regularity, amusement, and employment, alone to be found in an asylum—above all, the freedom from domestic anxiety and the injudicious expressions of sympathy by relatives—in a large majority of cases are productive of the best results.

The Delirium of Labor.—This is sometimes excited by the force and intensity of the pains in the second stage. It has been described by Velpeau, Cazeaux, and more fully illustrated by the late Dr. Montgomery, of Dublin, and I suppose most who have been long in practice have occasionally met with such cases. Since the common use of anæsthetics in midwifery, these cases must be very rare. I have seen but one in the past twenty-four years, and, as this was a very peculiar one, I will briefly relate it:

The patient, a lady of high culture and remarkable good sense, without the slightest hysterical tendency that I have ever been able to discover, awoke about five in the morning, near the end of her first pregnancy, shrieking, "I am drowning, I am drowning!" and jumped from her bed. The nurse, who was sleeping in the hall-bedroom adjoining, with the door standing open, and the husband, who occupied the back-chamber, rushed in and found her tearing about the room in the most frantic manner, screaming incessantly, without listening to a word said to her. I was immediately summoned, and, living very near, was with her in a few moments. I had previously ordered chloroform in anticipation of her labor, but it required the united efforts of her husband, nurse, and the servants in the house, to hold her sufficiently quiet for me to bring her under

the influence of the anæsthetic. I overwhelmed her with the chloroform as speedily as possible, and then, on making an examination and finding an arm protruding from the vulva, I delivered at once a living child by turning. The after-birth speedily followed, the binder was applied, and she was placed in a dry bed before she awoke. She had, undoubtedly, been aroused from a sound sleep by the rupture of the membranes, discharge of the waters, and escape of the child's arm. It is quite certain that less than an hour elapsed from the time of this occurrence until she awoke quite calm and quiet from the sleep of the chloroform, yet one can easily understand the emphatic declaration of her husband, that this hour was an eternity to him. By my urgent injunctions, no allusion to the incidents of her first labor has ever been made before the patient, and she has often expressed her surprise to me that her only recollection of it should be that, on awakening, she saw her mother holding a baby.

Insanity of Lactation.—I have seen but seven cases of this type, and these were all in consultation. All recovered from the insanity, but two died within a few months after I saw them, from phthisis. All of these were cases of melancholia. As I before remarked, the physicians to insane hospitals see these cases much more frequently than obstetricians. It is essentially due to anæmia of the brain. Dr. Tuke says that when mania occurs, it is of an evanescent nature, violent while it lasts, but not associated with the obscenity of language observable in puerperal mania. Both forms, mania and melancholia, are readily curable when taken in time.

Puerperal Mania.—The insanity which first shows itself during the puerperal period is most properly

called puerperal mania, for this is the type of the disease in a great majority of cases. In Dr. Tuke's table, 57 out of the 73 cases of puerperal insanity were cases of mania. It is my belief that, if the cases which occur in private practice during the first fortnight after labor, and which either recover within a couple of weeks or pass into the stage of dementia or melancholia, and form no part of hospital statistics, could all be aggregated, it would be found that fully ninety per cent. have the original type of mania. Again, puerperal mania is generally manifested during the first two weeks after confinement, and, by the end of the month, the patients have recovered, or the disease has passed into a different type. Puerperal melancholia rarely, if ever, is developed until the latter half of the month, and these, being the most intractable, are the cases most likely to be transferred to insane hospitals. At least, this is the result of my observation.

Puerperal mania is the form with which obstetricians have most frequently to deal. In some few rare cases, it is suddenly developed without any forewarning symptoms, but, in by far a larger number, there are very characteristic prodromic symptoms, sometimes continuing for a few days and in other instances only a few hours before the explosion. There is generally an unusual excitement of manner, although, in a few, a morbid melancholy air first attracts attention. A sudden aversion is displayed toward those who have been before best loved; an excessive loquacity, or an obstinate silence, weeping or laughing equally without a motive, a morbid sensibility to light, to noises, to odors, a suspicious watchful expression of the eye, and sleeplessness, are symptoms, which, occurring in a woman who has been confined within ten or fifteen days, indicate an

impending attack of puerperal mania. There are often muscular movements of the eyelids, the face, and the hands, very much resembling the appearance of a patient on the brink of delirium tremens. Indeed, the general symptoms are often wonderfully like those which are characteristic of the beginning of delirium tremens, and, in the case of the wife of a medical friend, which I shall presently relate to you, a painful suspicion existed in the mind of her husband at first that the real disease was delirium tremens.

There are certain symptoms which very generally characterize the moment of the attack, but these are usually of short duration. The facial expression is very peculiar, and, having once been seen, will always be remembered. The features are drawn, pallid, the cheeks and forehead are covered with little drops of perspiration, and the whole air of the expression is unsettled, indicative of fright or fury.

When the malady is fully developed, the patient becomes very boisterous and noisy, incoherent in her language and in her gestures. She stares wildly at imaginary objects in the air, seizes any word spoken by those near, and repeats it with "damnable iteration," clutches at every thing and every one near her, throws off all covering, jumps from the bed, and even the most refined and religious women, when possessed with the demon of puerperal mania, will scream out oaths and obscenity with a volubility perfectly astounding. Erotic manifestations occur in a majority of cases. Masturbation is sometimes noticed, but I believe, as Dr. Tuke suggests, that this is more the result of a wish to allay than to excite irritation. Nearly one-half of these cases manifest a suicidal tendency, but rather as a sudden impulse than as a settled determination.

While many of these appearances are very like those of delirium tremens, the physical symptoms are in striking contrast with those of this disease. The patient is pale, cold, clammy, with a quick, small, irritable pulse; the features are pinched, at times almost collapsed-looking. There is usually great muscular weakness, with now and then a momentary spasmodic display of unusual strength.

I wish especially to urge it upon your attention, that other grave diseases may exist in a latent form, coincident with the mania, the manifestations of which are masked by the mental symptoms. In this hospital, one patient has died with pelvic peritonitis, another, with pneumonia, and a third, with pericarditis and endocarditis; and in neither, was the disease suspected until revealed by the autopsy. All recent authors agree that phrenitis connected with puerperal mania is excessively rare.

Prognosis.—This involves the three questions, of the duration of the disease, the mental recovery, and the recovery of the general health. Dr. Tuke says: "Puerperal mania of itself does not kill, and when you have to combat it alone, not only death is not to be dreaded, but, in the very large proportion of cases, a return to sanity may be prognosticated. It is, perhaps, *the* most curable form of insanity. This statement is made advisedly, but does not extend to those cases which are placed under asylum treatment as a *dernier ressort.*" As to the duration of the disease, in some, but comparatively few cases, it entirely disappears in a few days. I have been struck with the fact that, in all the cases which I have seen, where the mania has followed puerperal convulsions, the duration of the mania has been limited to three or four days, and the patient has

speedily recovered, or she has died within this period. I only mention the fact, without attempting to offer any theory to explain it.

In a majority of cases, the mania gradually subsides within a period of three weeks, more frequently earlier, and is followed by a condition of partial dementia, with some delusions, especially as regards personal identity. These gradually disappear, leaving a kind of intellectual barrenness, like one waking from a dream. From this condition, you may confidently hope for ultimate recovery. In some cases, the malady is prolonged two or three or more months; but, if beyond six months, the chances of recovery are very small. When death is the result, it is almost invariably due to some associated disease, as peritonitis, or cellulitis, pneumonia, and in some exceedingly rare cases, phrenitis, the fatal result usually occurring in a very few days.

Causes.—Among the predisposing causes, hereditary tendency is the most prominent, especially traceable to the female side of the family, much more frequently than to the male. This was proven to exist in 22 of the 57 cases of Dr. Tuke; Esquirol, 1 in 2.8; Marcé, 24 in 56; Helftt, of Berlin, 51 in 131.

The next cause which I shall mention as predisposing to this malady is dystocia. In the 73 cases of Dr. Tuke (including both mania and melancholia), the labor was complicated in 23. Dr. Tuke remarks: "The various irregularities of labor doubtless operate in different ways, those where the suffering has been long continued depressing the nervous system directly, those in which large quantities of blood have been lost producing anæmia of the brain, and, in the case of the child being still-born, a moral shock acting on the mind naturally predisposed to this affection." I shall add, to

those causes that I have mentioned, anæmia and eclampsia. Moral causes are no doubt among the most frequent of the predisposing causes, but they are also exciting causes.

Exciting Causes.—It is my firm conviction that mental emotions constitute the exciting cause of puerperal mania infinitely more frequently than all other causes combined. The relative frequency of puerperal mania is just in proportion to the susceptibility to the influence of emotional causes. In Würzburg, the proportion of cases of mania to the whole number of confinements was 1 in 1,487; in Prague, 1 in 1,228. It is not strange that Scanzoni, studying the malady in this field, should regard the frequency of mania as exaggerated, at the same time that he admits that hospital records probably do not accurately represent the relative frequency in private, as it is notoriously more common in the well-to-do classes. Now, while this is undoubtedly true in Scanzoni's field of observation, the exact reverse of this statement is true with us. I have visited the lying-in hospitals of Würzburg, Prague, Munich, and many others in Germany, and I have conversed with Scanzoni on this very subject. From him I learned that with most patients in these hospitals, there is no sacrifice of domestic ties or social position in going to the hospital, but, on the contrary, many are in every way better off than when out of the hospital. They have never before been so well cared for. For most of them, there is no stigma of disgrace in being there, and no consciousness of moral wrong or loss of position among their associates by becoming a mother without being a wife. Among the lower classes in some parts of Germany, I believe it is considered a perfectly legitimate business for young girls to become pregnant

to qualify themselves for the position of wet-nurse and earn some money. There is, then, an entire absence of those moral causes of puerperal mania, which exist in tremendous force in this hospital, as I shall presently show you.

Then contrast the difference in frequency between the patients in the lying-in wards of St. Giles's Infirmary, where, in one series, there was one case of mania in 1,888 confinements, and the patients of Queen Charlotte's Lying-in Hospital, where there was one of mania in 182 of labor.

Now, mark the difference between the moral condition of the patients in this hospital and those whose statistics I have given. A large majority of patients in our lying-in-wards are of foreign birth. They have come to a new country, leaving friends behind, with the hope of improving their condition, and many are disappointed in this respect. A large proportion, probably more than one-half, are unmarried. It is impossible to ascertain the truth on this point, for many represent themselves as married and deserted by their husbands, and some of these are subsequently found to be single. But this very deceit shows a moral sense on this point. Then many, who have been wronged and abandoned by their seducers, prefer to die in the hospital rather than have their disgrace known to their relatives. In addition to this, I am well convinced that our climate has a marked influence in developing the nervous susceptibilities of Europeans who come here. Then, again, there is no part of the world where the lapse from virtue in women is so severely punished by social ostracism as in New England, and she contributes her quota of poor girls who rush to a great

city to hide themselves, and are at last driven to the hospital as their only resource.

Now, in view of all these facts, I think that you will agree with me that, if statistics ever prove any thing in regard to the causes of disease, they prove that moral emotions are the great exciting cause of puerperal mania.

I will mention a curious fact that has occurred in my experience: Since 1855, I have seen thirteen cases of puerperal mania in the wives of physicians, nine in this city, and four in the adjoining cities. All but one were primiparæ. It has struck me as very extraordinary, that so large a number should have occurred in one special class, and I think the following is the probable explanation: All of these were ladies of education and more than usual quickness of intellect, and, beginning a new experience in life, and having access to their husband's books, they probably had read just enough on midwifery to fill their minds with apprehensions as to the horrors which might be in store for them, and thus developed the cerebral disturbances, just as any other moral emotions may.

Some authors have sought to show that the exciting cause of puerperal mania was to be found in the peculiar state of the sexual system which occurs after delivery. Others would make anæmia and exhaustion the principal exciting cause.

Others, again, and most prominently the late Sir James Simpson, regard puerperal mania as especially due to a toxæmia, and as most frequently associated with albuminuria. Sir James Simpson suggests that "mental emotion probably acts intermediately on the mind by its morbific agency on the body." He also says that "he has only seen one instance of late years at-

tributable to such a primary depressing mental cause, and in this case the urine was highly albuminous, as it is usually found in puerperal convulsions." Many others have seemed to adopt the views of Professor Simpson in regard to the influence of albuminuria in developing puerperal mania. Dr. Foster Jenkins, of Yonkers, published an interesting case of puerperal mania in the *American Medical Monthly*, 1857, in which Professor Alonzo Clark and himself found albumen abundant in the urine; the patient was treated mainly for albuminuria, and recovered. My friend, the late Professor Elliot, was disposed to regard albuminuria as a prominent element in causing puerperal mania, but, of the five cases of puerperal mania reported in his "Obstetric Clinic," not one was associated with albuminuria.

As for myself, since the suggestions of Sir James Simpson were first published on this subject, I have been on the constant watch for albuminuria in every case of puerperal mania that I have seen, and I have found it associated with so small a proportion of the cases, that I am compelled to regard it, when present, as simply a coincidence and not a cause. To adopt Professor Simpson's remarks relative to anæmia and exhaustion as a cause, I should say the alleged cause is very, very often present in practice, without the alleged effect following. The theory at best, if applicable at all, is applicable to a very limited number of cases, and affords no more satisfactory explanation of the origin of the disease than does the more general statement, that puerperal mania results from the peculiar state of the sexual system which occurs after delivery.

Treatment.—Dr. Tuke says: "To shave and apply cold to the head, administer tartar-emetic, purge, and blister, are not uncommon remedies (!) applied where

mania exists. In puerperal insanity this bad treatment insures a lapse into dementia—the patient can resist the disease, but not the remedy; each dose of antimony, each cold application, each blister, puts the case further and further beyond the control of the physician." As regards my own experience and observation, I am heartily in accord with Dr. Tuke.

The most recent article on puerperal mania, which has been probably more generally read than any other by the profession now in practice in this country, is the lecture by Sir James Simpson, in the volume of "Clinical Lectures on Diseases of Women." The warm admiration for his genius, the great respect for his remarkable talents and industry, and the deep-felt sorrow for the loss which the profession and the world sustained in his comparatively early death, combine to add force to the intrinsic weight of his suggestions. But his remarks on the treatment of puerperal mania leave the strong impression on my mind that he could not have had the personal supervision of many cases, although he probably saw a great many in consultation. I refer more especially to his remarks on "nervous sedatives," "specifics," and "depurants," which bear the stamp of theoretical suggestions, rather than of practical deductions from clinical observation.

Bleeding, once so much in vogue, it is now settled, is not only useless, but positively injurious in all but very exceptional cases. A vast majority of cases are undoubtedly associated with anæmia and nervous exhaustion. In one case only, have I seen venesection positively beneficial. The patient was in a sthenic condition. She had lost very little blood at the time of labor, and the symptoms of phrenitis were very marked.

Vascular sedatives are equally useless, except when the mania is complicated with evident symptoms of some latent local inflammation, a complication which cannot be too sedulously watched for.

Laxatives and emetics should never be given, except when there are positive indications of their necessity.

As insomnia is one of the most striking features of puerperal mania, opiates are naturally suggested, and I have found, in the cases that I have seen in consultation, that they have generally been tried. Dr. Tuke says: "Drugs seem of no avail; opiates, more especially, do more harm than good. A large dose, given at the very first indication of insanity, is said to have the effect of cutting short the attack; this I cannot speak to, but repeat the statement previously made: that when it has fairly established itself, although large doses of opium may moderate the intensity, they tend to prolong the period of mania."

For my own part, I have never seen opium in any doses cut short the attack, although I have often known it to be tried. I think I have seen opiates prove of great service, in some few cases, where I have believed that the mania was complicated with latent pelvic peritonitis. But it is only in such cases that I have ever found them apparently useful. Mind you, I am now speaking of mania, not of melancholia.

It is obvious that the leading indication is to allay the brain-excitement. The question is, How best to accomplish this? My answer would be:

1. By restoring exhausted nerve-power:

(*a.*) By improving the nutrition of the brain. I look upon good food, a plenty of such as is easily assimilated, to be one of the most important points in

the treatment of this malady. Some obstinately refuse to take any thing, but, by management, tact, and perseverance, this difficulty is generally overcome after a time. Then, in many cases, even in the early periods of mania, you will find that tonics are of great service. Those which I most frequently recommend are, the tincture of the chloride of iron, the chlorate of potash, and the sulphate of bebeerine. The latter is greatly to be preferred to quinine, from the fact that it has much less tendency to induce cerebral congestion.

(*b.*) By inducing sleep. This is nearly as important in puerperal mania as in delirium tremens, but there is this difference: In delirium tremens, when we have secured for our patient some hours of refreshing sleep, we ordinarily find that the disease is essentially overcome. But this is not the case in puerperal mania; for I have often seen patients, in whom good sleep has been secured for nights; and yet, when awake, the maniacal condition has continued for some days as before. Still, there is no doubt that every hour of good, sound sleep contributes something toward the patient's recovery. Now, neither opium nor the bromide of potassium will produce sleep in maniacal patients, as a general rule. I have used the latter largely for this purpose in puerperal mania. I have often found it very useful under certain circumstances, to which I shall presently allude, but not as an hypnotic in mania.

Soon after the discovery of the anæsthetic effect of chloroform, by Professor Simpson, I suppose that I, in common with many others, anticipated great benefits from its use in puerperal mania. But I think all have been disappointed in this particular. The sleep induced was of very short duration, patients seemed in no way benefited by this sleep, and generally the excite-

ment seemed greater after its use than before. Professor Simpson says: "I have sometimes found that a patient, after being anæsthetized by means of chloroform, has continued to sleep on, and has afterward wakened up quite well." I am quite confident that this must be a very exceptional result, for I have never seen it.

It is in this disease that I have found the chloral-hydrate of immense value. It apparently does not interfere in the slightest degree with any of the organic functions; it is not followed by any unpleasant secondary effects, as opium often, and bromide of potassium sometimes is; and in mania I have never yet seen it fail to induce sleep.

Whatever chemists may tell us, I am certain that the effects of chloroform and of chloral-hydrate differ in many essential particulars:

Chloroform induces a very profound sleep, but this is of short duration. If the patient be awakened, she does not fall asleep again, without a renewal of its administration.

The sleep from chloral-hydrate is prolonged often for hours, and, if awakened while under the influence, the patient at once falls asleep again.

After the sleep of chloroform, there is frequently cerebral disturbance for a few moments after waking, as there is also just before the subject comes under its influence.

The sleep from chloral-hydrate is neither preceded nor followed by symptoms indicative of cerebral excitement.

Chloroform is of immense value in preventing and controlling convulsions, but is of no service in producing sleep and allaying excitement in the maniacal.

The chloral-hydrate has very little if any influence

in preventing or controlling convulsions, but is by far the best agent known for inducing sleep in puerperal mania. I usually prescribe it in fifteen or twenty-grain doses, well diluted, to be repeated every two hours until the effect is produced. I have given it in thirty and forty-grain doses, but I have now settled on the smaller quantity, as being safer and just as efficacious, if repeated until the desired influence is obtained.[1]

2. By combating all complications:

[1] Since this lecture has passed out of my hands for publication, my attention has been called to a very important and interesting paper, published during my absence from the country, in the *New York Medical Journal*, June, 1872, by Robert Amory, M. D., Boston, Mass., entitled "Experiments on Animals, disproving the Theory that Chloral-hydrate acts on the Organism on account of its Decomposition into Chloroform, by the Alkaline Carbonates in the Blood."

The results of these experiments seem curiously to harmonize with my observations from the clinical study of the comparative action of the chloral-hydrate on the organism.

On the other side, it should be mentioned that Dr. Oscar Liebreich, to whom the world is indebted for the discovery of the immense therapeutic value of the chloral-hydrate, has recently published a third edition of his "Treatise on the Chloral-hydrate," in which he still maintains his original theory in regard to the action of this agent by its decomposition in the blood into chloroform. His reasoning, like my own, is based purely on clinical observations, but with quite opposite results. For example, he mentions that, in a case of gout, a dose of hydrate of chloral produced excitement, but, when the patient had been treated with carbonate of soda for a week, the same dose acted as an hypnotic. Dr. Liebreich's theory is, that this was due to the circumstance that, at first, the formation of urate of soda deprived the blood of its normal amount of alkali, and thus prevented the transformation of the chloral into chloroform. In confirmation of this theory, he asserts that it has been noticed in typhus, where there is an excess of alkali in the blood, that small doses of chloral readily produced sleep, while larger (even moderate) quantities gave rise to symptoms of poisoning. He also states that the hydrate of chloral has been found to act beneficially in a number of cases of puerperal convulsions, and he explains this by accepting Frerich's theory, that the convulsive attacks are connected with the transformation of urea into carbonate of ammonia, and by supposing that, besides the production of chloroform, there is a formation of hydrochloric acid which neutralizes the ammonia.

In my lecture on puerperal convulsions, it will be seen that I am com-

(*a.*) *Functional.*—If there be constipation, give laxatives. If the renal secretion be deficient, of course, diuretics will be useful. It is always important to watch that the bladder does not become over-distended.

(*b.*) *Cerebral Erethism.*—Maniacal excitement often produces a cerebral erethism—shown by the flushed face and red eyes—which, no doubt, was formerly often mistaken for phrenitis. It is in just these cases that the bromide of potassium is very useful. I have frequently seen great benefit from giving twenty to thirty grains once in six hours. But it does not often induce sleep, under these circumstances, and so at night I suspend the bromide, and give the chloral-hydrate.

(*c.*) *Local Inflammations.*—Let me again warn you of the danger of overlooking the existence of these complications, as they are not manifested by the usual symptoms, being masked by the mania. The treatment must be adapted to the special form and locality of the inflammation, modified by the general condition of the patient.

In this connection, I will give you the brief history of a case which, to me, was very interesting and suggestive: In November, 1869, a medical friend asked me to see his wife, who had been confined with her sixth child, just a week before. I had never before seen her, and found her pale, with a hot skin, a staring expression of the eyes, and a pulse of 140. Every question asked her,

pelled to differ from Dr. Liebreich, both as regards the facts and the theories, as to the action and the value of this agent in puerperal convulsions.

It seems to me that the experiments of Dr. Amory, so far as they have gone, have conclusively demonstrated that the theory of Dr. Liebreich is erroneous. It is to be hoped that Dr. Amory will continue his experiments, as he intimates his purpose of doing, to determine whether chloroform be present in the urine of a person taking chloral.

she answered with an abrupt negative. The day before, she had taken castor-oil, and seemed to suffer a good deal of pain when the medicine acted, and for the first twenty-four hours after labor there had apparently been a good deal of difficulty and pain in passing water. She would neither permit myself nor her husband to place the hand upon the lower part of the abdomen, and of course a vaginal examination was not to be thought of. When I attempted to put a thermometer in the axilla, she exhibited great resentment of manner, apparently thinking it immodest. On retiring to another room, I found that she had been a model wife, and that her husband had been accustomed to lean upon her, leaving to her the management of all his affairs, except those which were purely professional.

Three weeks before her confinement, she had lost by death her eldest daughter by a former husband, and since that period she had never been seen to weep, and had never spoken of her daughter, but attended to all her duties with a silent, unnatural calmness of manner. Her labor had not been long, and was in every respect normal. The mammary secretion was less than in her former confinements, and she seemed unusually weak; for this reason her husband had given her, for the two days previous to my seeing her, a little brandy twice a day. On the day before, she began to ask very frequently for it, and this excited the alarm of her husband. He had formerly held an official position where he had seen a great deal of delirium tremens, probably a hundred-fold more than I ever saw. From the fact that, before this illness, she would take wine, only when absolutely prescribed, and that now she urgently demanded brandy, and also from the change of her manner, her husband had adopted the theory, ter-

ribly distressing to him, that grief had driven her to secret drinking, and that she was now on the verge of delirium tremens.

I should mention, as a curious circumstance, that he had been in active practice thirty-two years, and had never seen a case of puerperal mania, although other physicians, who have been equally long in practice, have told me the same thing.

I expressed the strong conviction that she had severe inflammation of the pelvic organs, and that she was about to have puerperal mania. I suggested that poultices should be kept over the lower part of the abdomen, that a suppository of the aqueous extract of opium and three grains of the butter of cacao should be pushed into the rectum every third hour; that she should have beef-tea, all she could be induced to take, at short intervals; and that, as a means of bribery and corruption, to induce her to permit the use of the suppositories, she should have a tablespoonful of brandy in a half-tumbler of milk after each suppository was introduced.

The next afternoon (Sunday) I was again summoned, when I found her furiously maniacal, with all the characteristic symptoms of puerperal mania. She had kept the poultice on about two hours, and then took it off and threw it violently at the head of her husband. She had not permitted the use of a single suppository. She had taken no beef-tea, and but one glass of milk and brandy. About noon, she became very violent, perfectly astounding her family by her swearing and language generally. I put her under the influence of chloroform as soon as possible, and then made a careful examination. The evidences of peri-metritic inflammation were conclusive, and the whole abdomen was very

much swollen and tympanitic. On coming out from the influence of the anæsthetic, she was even more violent than before. While under the effects of the chloroform, the pulse was 120, and the temperature, 105°.

As I looked upon the peritoneal inflammation as the dangerous feature in this case, I advised that all our efforts should be directed to arrest this, and that we should address no treatment to the cure of the mania. I recommended that ten drops of the tincture of the veratrum viride and three drops of Magendie's solution of morphia should be given every hour, until there should be some indication for suspending or diminishing one or both of these articles. I saw her again late in the evening, at seven the next morning, and again, before eleven, and at three in the afternoon. Both medicines were continued without interruption, and without any apparent effect.

Early in the evening, I received an urgent summons to see her, as her husband believed her to be dying. I found her under the full influence of the veratrum viride. Her pulse was full, beating slowly at the rate of 44 per minute. Her face was very pale, her skin cool; she was sweating most profusely, and had vomited twice. She was constantly talking in a low tone, very rapidly, indistinctly, and incoherently. She had taken over half an ounce of the tincture of veratrum viride, and more than a drachm of Magendie's solution. I have used the veratrum viride more than thirty years; but this lady took at least four times the quantity I have ever given to any other patient before she began to show any evidence of its specific effects. The symptoms which most alarmed her husband I knew to be due to the veratrum viride, and I assured him with great confidence that she was radically better. She

was very thirsty, and swallowed with avidity every thing put into her mouth. I now recommended that she should have beef-tea or milk-punch at short intervals, and no medicine, unless the pulse rose above 80, when she was to have five drops of the veratrum viride, to be repeated in such doses as might be necessary to keep it below that point. She slept none that night nor the next day, but kept up her incessant chattering in a low tone. She took the veratrum viride, three times, with three drops of the morphia, during the following twenty-four hours. She also took a sufficient quantity of beef-tea and milk-punch.

I now proposed to give her a half-drachm of the chloral-hydrate, stating that I had never yet seen or heard of its being given in such a case, as it was quite a new medicine. Her husband consented with great reluctance. In less than ten minutes after she took it, she was asleep, and continued so for seven and a half hours, except that three times during this period her husband roused her sufficiently to give her some nutriment. The chloral-hydrate was repeated the next night. The mania now gave place to occasional lucid intervals, with more or less intellectual wandering, which continued for some weeks, but perceptibly and constantly decreased until she was perfectly restored as to her mental condition. But I regret to say that she is still a feeble woman. I examined her but a short time since, and found the uterus very decidedly enlarged and immovable in the pelvic cavity, and she suffers from the symptoms which are generally associated with this condition.

3. By such moral treatment as will best secure the patient against all causes of nervous excitement, and will tend to excite in her a desire to obtain self-control:

This is difficult to define in words, and still more difficult to secure. It implies the greatest kindness, but no demonstrations of excessive solicitude; firmness, but no appearance of governing or controlling; incessant care and watchfulness, concealed by an air of indifference; a ready tact in turning the current of thought or will, but no contradiction or impatience. Few nurses, and still fewer friends, are able to exercise all these combined qualities. The physician will better teach them to the attendants, by his own manner when with the patient, than by didactic instructions.

If the moral treatment can be secured in a great measure at home, and the patient begin to show unequivocal signs of improvement within two or three weeks of the commencement of the attack, it is better that she should remain at home. But if she cannot have the advantage of proper moral treatment, and especially if the malady be not positively mitigated within the puerperal month, I have no doubt that the chances of recovery will be greatly increased by placing her in an asylum, where all the benefits of moral treatment are certain to be secured. This should not be delayed too long; as all physicians to these institutions are agreed in saying that the probabilities of cure are diminished just in proportion to the duration of the disease.

There is not the same objection to the removal to insane hospitals of those who suffer from puerperal mania, as exists in other forms of insanity, because this removal does not suggest the same loss of family or social position. The public are ready to accept the puerperal state, which does not imply previous weakness of intellect or mental disease, as the specific cause of the overthrow of the mind, and therefore they have sound reasons for anticipating a perfect recovery.

I shall only add by way of caution that, in my observation, even those who are perfectly cured generally manifest some little occasional signs of moral perversion or mental eccentricity for months, and sometimes for a year or more.

I have nothing to add in regard to puerperal melancholia, because I have literally no clinical experience in this malady. I have seen but one case in private practice. In this hospital, we frequently have cases of this form of the disease, although it is very much more rare than mania, but, as it is generally developed the latter half of the puerperal month, and as it is more chronic in its type, the patients either die of some intercurrent disease, which is often the case, or are transferred to the asylum on Blackwell's Island.

LECTURE XI.

RELAXATION OF THE PELVIC SYMPHYSES.

Case—Not much referred to by obstetric authors—Dr. Snelling's monograph—Importance of a knowledge of this subject to young practitioners—Recent German and French writers on the subject—Scanzoni—Debout—Stoltz—May be developed during pregnancy—A certain degree of relaxation physiological—As a disease, seen most frequently in the puerperal period—Causes—Not due to a narrow pelvis—More frequently occurs in those having a broad, capacious pelvis—Probably due to a mechanical cause, which prevents the return of the venous blood from the tissues involved—Symptoms—Diagnosis—Duration—Treatment—Inflammation of the pelvic articulations.

"CASE XIII.—Mary ——, born in Ireland, age unknown, married, admitted into Bellevue, January 12, 1861. Was delivered by Dr. Elliot, with forceps, of her seventh living child, five weeks since. Weight of child, eight and a half pounds, male. Former labors have always been short and natural. Patient suffered from severe after-pains, and for five days it was necessary to use the catheter. Had no other bad symptom, but, when she attempted to stand, she found it impossible, nor has she been able to walk, even with assistance, since her confinement. In all other respects, her health is perfectly good. The lochia ceased about two weeks after her confinement. Lactation is abundant, there is no vaginal discharge, and no pains in the pelvic region, except when she attempts to stand or walk. Has been suspected of malingering."

"The history of the labor will be best given by the following note from Dr. Elliot, which I shall read:

"Dr. Fernandez, the house-physician, sent for me about three o'clock A. M., to see Mary ——, in her seventh or eighth labor. Former labors had been easy. The membranes had ruptured twenty-two hours before, and the pains had been regular and frequent,

but not strong. For two hours, they had been decreasing in force and frequency. Her pulse was now 120, and weak; she was very restless, tossing about in the bed, and her mind was wandering. Before my arrival, the catheter had been used, and about twenty ounces of urine drawn off. On examination, I found the pelvis normal, and it seemed to me rather larger than usual. The head was but slightly engaged at the brim, with the occiput at the right sacro-iliac symphysis. She was put under chloroform, and I applied my forceps, and, rotating the occiput round to the symphysis pubis, I delivered with great ease. My forceps worked admirably, and I do not believe that I could have accomplished rotation, at least so easily, by any other. The catheter was necessary for a few days, but I heard of no other abnormal symptom during my term of service."

Gentlemen: You now see that this patient can stand, resting her weight on one or the other leg, but not on both at the same time, and those who are near can see a perceptible elevation of the ilium on the side upon which she bears her weight, and that her head and body instinctively incline to the side that she rests upon. These attempts evidently cause pain, but the character and seat of the pain, the patient describes very obscurely. Now, placing her on the table, you observe that strong traction on either leg causes a perceptible movement of the pubic bone of that side—I should think, an eighth of an inch. These movements, however, cause much less pain than movements with the weight of the trunk resting upon the pelvis. I cannot demonstrate to you that there is widening or swelling of the interosseous tissues between the pubic bones, nor am I absolutely certain that there is any. But you can see that she is short, not more than five feet in height; that, for a woman of her size, she has very broad, capacious hips; and, although confined only five weeks since, she has a very lax, pendulous abdomen, with a heavy fold of in-

tegument hanging over the crest of the pubes. I saw her for the first time yesterday, and then found, by using a catheter, after she had evacuated the bladder as thoroughly as possible, there would still remain four or five ounces of urine. This experiment has been repeated three times, with the same result.

The symptoms that this patient suffers from are due to relaxation of the symphysis pubis, an affection of rare occurrence, as you will infer from the fact that this is the only case of the kind that I have known of in this hospital; but I have seen quite a number of cases in private practice and in consultation. In many of your obstetric works, you will find no allusion to it, and in most others there is only a slight reference. In the work of Denman, in the first part, in describing the anatomy of the pelvis, he gives a very complete exposition of this affection; and Dr. Francis, the editor, adds a full note on the subject, with the report of a case in the practice of Dr. Wright Post, and another of relaxation of the sacro-iliac symphysis, in the practice of Dr. Hosack. Next to Denman, Burns and Meigs give the best discussion on the subject. Churchill, Tyler Smith, Cazeaux, and Bedford, make only a slight allusion to it.

The most recent, as well as the most complete essay on this subject, in the English language, is by my friend, Dr. Frederick G. Snelling, of this city, which was published in the *American Journal of Obstetrics*, vol. ii., No. 3, February, 1870. I shall have frequent occasion, in my remarks, to refer to this essay.

Although the subject has been too much overlooked by obstetric writers generally, yet it has been known in medicine, since the time of Hippocrates, and has been the theme of several monographs by able authorities,

which you will find referred to in the paper by Dr. Snelling. It may occur in the practice of any one of you; and, as nothing is more apt to damage the reputation of a young obstetrician than that a patient should fail to recover rapidly after childbirth, unless the obstacle to her recovery can be made perfectly clear to her friends, you see the importance of being alive to the existence of this affection, and of fully understanding its character.

Before telling you my own views, I shall give you the opinions on this subject of the most recent German and French writers.

In the fourth edition of Scanzoni's "Lehrbuch der Geburtshilfe," his views on this subject are thus given:

"Sometimes the ordinary relaxation of the pelvic ligaments during the gravid state increases to such an abnormal degree that every stronger contraction of the muscles inserted into the pelvis occasions considerable motion of the bones upon one another, which is attended with the most tormenting pains, and renders the slightest motion impossible, confining the patient uninterruptedly in bed. The affection begins with a dull pain in the pelvic ligaments, in the thighs, and in the lumbar region; motion gradually becomes difficult and painful, so that walking is impossible. The patient feels, on standing, as though the unsteady body would fairly tear the pelvis asunder, and sink between the feet to the ground. In higher degrees of the trouble, it is possible to feel the motion of the pubic bones at the symphysis, and to hear and feel a peculiar crepitus, such as exists between fragments of broken bone. The skin over the symphysis becomes so sensitive as to render the slightest touch intolerable. We are not to include in this category cases of osteomalacia, and puer-

peral inflammation of the symphysis, where the relaxation is simply a local expression of a general disease.

"It occurs especially in persons who have had pregnancies following one another in rapid succession. Many were persons with narrow pelves, presenting a repetition of a normal phenomenon in many classes of animals, where the size of the fœtus requires a considerable separation of the bones, and an enlargement of the pelvic apertures.

"In these cases, it seems as though the uterus developed in the narrow pelvis, and, hindered in its ascent, worked with such force toward the periphery of the pelvis, as to contribute in an important manner to separation of the bones, through the relaxation of the cartilage and ligaments. We have frequently seen this condition in narrow pelves, reaching such a degree, that even moderate tractions with forceps have caused a rupture of these connections, and a separation of the pubic bones. We have likewise observed that puerperal inflammations of the pelvic bones are especially frequent in persons with contracted pelves.

"We regard the influence of this disease upon pregnancy and labor to be highly exaggerated, and we believe the most painful symptoms ascribed to it belong properly to other diseases, especially to osteomalacia. We regard repeated exact observations as alone capable of throwing light upon this subject—and the whole treatment consists in avoiding all exertion during pregnancy, and wearing a suitable bandage. Tonic and astringent internal remedies, and fomentations, accomplish nothing. We know of no case of recovery during pregnancy, but have several observations of perfect cures after delivery."—(*Geburtshilfe*, fourth edition, vol. ii., p 126.)

In the third volume, page 487, of the same work, Scanzoni remarks that he has met with but a single case of abnormal relaxation of the pelvic ligaments, occurring independently of any inflammatory process. This was the case of a young woman, who complained, in the course of her second pregnancy, of painful sensations in the sacro-iliac synchondroses, and difficulty in using the lower extremities. These pains increased to a considerable degree during labor, which terminated naturally, after forty-two hours' duration. The child's head was unusually hard and large. When he saw her, four months after delivery, she was anæmic, but the functions of the internal organs were undisturbed. On the other hand, every motion of the lower portion of the body was impossible, partly on account of violent pains in the sacral synchondroses and pubic symphysis, and partly from a feeling of giving way in the ligaments. Besides, every time she attempted to turn over, she felt a grating in the region of the right synchondrosis, as though two bony surfaces were rubbed upon one another.

An examination showed no perceptible morbid alteration, except an abnormal sensitiveness in the region of the right sacral ligament, but he often had occasion to feel clearly the above-mentioned grating by means of the outspread hand. The patient said the motion of the symphysis some weeks after delivery was so considerable that, upon raising the right lower extremity with the hand, the elevation of the extremity of the right pubic bone could be quite plainly distinguished. She was eight months under treatment, during which time, neither local inflammatory nor general feverish symptoms were manifested. After four months' treatment (iron, iodide of potash, ointments

containing narcotic remedies, steel-baths), she had recovered sufficiently to turn in bed, while the rattling had entirely disappeared. After six months, she was able to walk short distances, and finally the employment of Brückenau mud-baths brought about complete recovery. Soon after, she again became pregnant, and the labor terminated without any disturbance. The patient, during childbed, complained of some pain in the right synchondrosis, but this soon entirely disappeared.

"Such cases are to be distinguished from rupture of the pelvic ligaments, which, as a rule, result from difficult labors terminated by forceps. We have only seen one case after a natural labor:

"A woman, twenty-two years old, accustomed to field-work, who had already had one natural labor, suffered from most violent pain during her second confinement, which ended but slowly. The child was unusually large, the head was very hard, and above the standard, in all its diameters. After delivery, the woman was extremely exhausted and complained of violent pains in the region of the right hip, running down to the knee. These pains increased in intensity until the next day, when they became worse, so that the patient could not make the least movement of the lower half of the body. At each attempt to move, she felt crepitus in the region of the right sacro-iliac synchondrosis. In this spot there appeared a long, smooth, reddened, and sensitive swelling, the size of the palm of the hand, which was the seat of the most violent pains upon pressure. There was pain, also, in vaginal examination, on touching the right sacral symphysis. When the patient moved, crepitus could be plainly felt, and a loud, crackling sound heard several steps from the bed. Fourteen days after de-

livery, a hard swelling, along Poupart's ligament, two fingers' breadth, caused by an exudation in the peritonæum, appeared, which yielded to warm baths and cataplasms, after two weeks. Six weeks after labor, the patient was able to make attempts at walking, by supporting the body with both arms upon the right knee. In the eighth week, violent pains returned in the region of the right synchondrosis, while the swelling in this situation presented fluctuation, so that the abscess had to be opened; whereupon more than a pound of thickened pus escaped. On introducing the probe, the rough, bare-lying bones could be felt, without the probe, however, passing into the joint itself. An improvement now took place, and, two days later, after about two ounces of a sticky, clear, albuminous fluid had passed away, the wound healed rapidly. Fourteen weeks after parturition, the patient was allowed to leave, in a healthy condition, but still a little lame.

"When the rupture has taken place at the symphysis pubis, we may quite frequently diagnosticate the malady during life, by the wide separation of the pubic bones, while the separation of the sacro-iliac synchondrosis can only be rendered probable by the presence, at the same time, of inflammatory manifestations in the ligaments, also taking into consideration the events occurring during the course of labor."

In "Schmidt's Jahrbuch," 1868, there is the following *résumé* from Debout, Danyau, and Stoltz:

"Debout, and most other authors, call attention to a minor degree of relaxation of the pelvic ligaments, during the latter months of pregnancy and after parturition. This relaxation, however, soon proceeds so far, that the movements of the bones upon one another are recognizable. Jacquier shows, by several exam-

ples, that the same thing may occur in non-pregnant women, and likewise in males. Debout furnishes historical notices of the occurrence of relaxation of the ligaments, with cases. Heretofore, constitutional diseases, scorbutic and scrofulous diatheses, were regarded as the most important causes of the difficulty. Debout, however, found seventeen cases, nearly half of which were persons of robust constitution; and in none, was there the slightest trace of scrofula or rachitis. In most cases, the first symptoms were manifested during pregnancy, some, at the outset, but most, in the seventh and eighth months. The attack began usually with slight pains, at first experienced only after protracted exertion or lifting heavy weights. These pains afterward became more severe, radiating from the symphysis pubis and the sacro-iliac synchondrosis. There was then an increased mobility of the pelvic bones. This usually occurred, to a greater degree, immediately after parturition. The pains frequently increased, so as to become very violent upon lifting the feet. They were often attributed to general debility, or, as Danyau had already remarked, to some uterine trouble occurring as a complication, especially as they frequently disappeared after the employment of measures adapted to uterine complaints, such as rest, lying in bed, etc.

"*Diagnosis.*—The impossibility, when recumbent, of the patient's raising the legs, especially the limb corresponding to the affected side, is a most important symptom. Shortly after parturition, there is evident motion at the points of junction of the pelvic bones, so that, upon extending and flexing the femur, with one hand upon the symphysis pubis, the pubic bone upon the side of the femur may be felt rising and sinking. The same motion is experienced, if the hand be placed on the ilium.

To investigate the sacro-iliac joint, which is the one most frequently affected, seize the cristæ ilii with both hands, and get the patient to walk, either with or without help. At each step, the ilium of the affected side is felt to be shoved upward, while that of the other side stands considerably lower. Occasionally, the patients complain of a sensation as though the body were sinking between the thighs. The pains are not proportioned to the degree of mobility. In some cases (the result of puerperal processes), inflammation and suppuration had partially or fully destroyed the joints.

"*Treatment.*—The most suitable time to cure a case is during the period of childbed; later attempts often require much time. Debout prefers compression by means of Martin's truss. In the last months of pregnancy, women incommoded in walking are surely relieved by the employment of a leather spring-bandage, stuffed like a hernia-truss, and buckling in front. Wearing the bandage two or three months after delivery suffices to prevent relapses. When the bandage is applied at a late period, say, after a year's time, the cure is often no longer possible, or at best imperfect, unless, perhaps, a subsequent pregnancy, during which, and four or five months after delivery, a bandage is worn, accomplishes a recovery. Where the trouble has been of several years' duration, the bandage will not, of course, cure, but simply render walking possible. Couerdt furnishes two cases, treated by Martin's bandage with favorable results. Pategnat reports a case where radical recovery took place, in which he employed a towel-bandage about the pelvis. In these cases, there was no rupture, but a simple stretching of the pelvic ligaments. Stoltz regards the relaxation of the pelvic ligaments as the result of a pathological pro-

cess. The physiological relaxation in most pregnant women could not possibly produce so wide a separation of the symphysis as to render parturition more easy. It is then really of a pathological nature, and occurs either spontaneously and slowly, or suddenly, upon the employment of force, or in consequence of extraordinary natural efforts. In the first class of cases, there were, abdominal plethora, an unusual enlargement of the abdomen, as the result of interference in the circulation, and a considerably increased volume of the uterus; and, in connection with these occurrences, proximate pressure exercised upon the pelvic walls, a cachectic condition, immoderate bodily exercise and exhaustion, rarely or never scrofulous dyscrasia, acted as direct causes, whereby irritation and inflammation were produced, and served as the forerunners of the disease in question. As curative means, the malady seldom requires that the patient should remain an unusual length of time in childbed. Besides internal tonic measures and external remedies (salves, baths, etc.), Stoltz found great benefit from the mineral baths at Baden-Baden. Cases of forcible separation of the symphysis belong to the domain of surgery; and bandages may prove of great service, though Stoltz never found himself compelled to employ them."

I have thought it my duty thus to give you the views of the most recent eminent writers on this subject, as there is so little to be found on it in your obstetric works. All agree that it may be developed during pregnancy, generally during the last two months of gestation; but, in some rare cases, it has occurred at an earlier period, and has even followed abortion.

The first case of this kind which I saw was in the early days of my professional life, and was developed

during pregnancy. A lady, in the eighth month of her first pregnancy, had, for several days, great difficulty in walking, with severe pain in the pubic bones, till one day she fell, while walking across her drawing-room. She supposed that she had caught her toe in the carpet. From that time up to her confinement, she could not walk or stand. After a very careful examination, I was unable to make out the diagnosis; and none of the authorities at my command threw any light on the question. I therefore called in consultation two quite prominent surgeons; one of them diagnosticated fracture of the neck of the femur; the other, fracture of the ilium or ischium. I watched the case very anxiously, naturally expecting a difficult labor and some untoward result; but, to my surprise, the labor, though a first one, proved brief and easy, with no abnormal symptoms. The patient passed through the puerperal condition, with nothing to excite apprehension; yet, on essaying to rise, it was found that she was still wholly unable to bear her weight. Some six weeks after confinement, I got her out of bed, and carefully attempted to make her walk. A point which struck me, and which I have never seen mentioned, was that she could stand with comparative ease, resting upon either one leg or the other, but could not balance herself upon both legs at once. This, of course, convinced me that there was no fracture of the thigh-bone; and the fact that there was no difference in her ability to rest upon the two sides showed that there could be no fracture of the ilium or ischium. Led by this to examine the symphysis pubis, I thought there seemed to be an increase of the space between the pubic bones; and also that the cartilage between them seemed softer than natural. When I left the place, some four years after-

ward, this patient was able to walk, only with great difficulty, upon crutches. Three or four years later yet, she was much improved, though still compelled to use crutches. I am told that, some fifteen years after that unfortunate pregnancy, she entirely recovered, and that she now walks perfectly well.

Dr. Snelling, in the essay to which I have referred, quotes the following very characteristic case from Professor Hodge, of Philadelphia, although the professor does not refer to the disease under consideration, but speaks of the peculiar phenomena in connection with a retroverted uterus, disappearing upon the removal of the displacement:

"About two months previous to the birth of the patient's fifth child, while walking across the room, she was suddenly checked in her progress by the seeming dislocation of the pubic bones, which she believed to be jointed, causing intense agony, accompanied by a sound like a pistol-shot. Leaning on something near by for support, her movement caused the bone to slip into place again, when she was enabled to take a few steps, but with great suffering. These painful sensations and sounds occurred again and again, when attempting to get up or lie down, till the birth of a fine, large child, which, it may be well to say, caused less pain than she had ever experienced on any previous occasion; leaving her, however, with so-called prolapse of the womb, and the innumerable distressing sensations of such disease, for eighteen months. She then became again pregnant, and enjoyed good health until two or three months before confinement, when she suffered as before, until the birth of the child, which, contrary to expectation, brought no relief. The pain in the bones seemed permanent—numbness and stiffness were pres-

ent in the left hip, which also gave way, with a noise and pain, when she would lift her foot. She then dragged it as if paralyzed. This continued for six months, until she was taken to Philadelphia, where she was relieved of some of her suffering; but ten months elapsed before she was sensible of a decided improvement in the condition of the bones."

I am fully in accord with Dr. Snelling as to the probability that a certain degree of relaxation and *ramollissement* of the symphysis occurs in many pregnant women, which may be regarded as physiological. He says:

"I think it is not forcing a conclusion to regard it as proven, from what has been advanced, that an uncertain, varying degree of relaxation or *ramollissement* does obtain in a very large number of cases, in the pregnant and puerperal condition, of a physiological and benign character, and entirely consistent with health, and that it is to the excess alone of this condition that the pathological results above described are due. The ligaments become saturated with serum and lose their firm and resilient qualities; the synovia is greatly increased and presses the bones asunder; the pelvis becomes incapable of sustaining the weight of the body, and so, gradually yields to the weight above; or some slight and insignificant movement of the patient suffices to precipitate the whole train of symptoms suddenly and at once. I am convinced that more such cases occur than is generally believed. There are so many distressing sensations incident to the lying-in state, that, if the affection be but slight and non-persistent, it is most natural to attribute it to the puerperal condition, or to some uterine displacement or irritation. Women themselves are so accustomed to vague pelvic and uterine and lumbar

pains, that they almost regard them as a natural heritage, and themselves assist in deceiving the physician by ascribing them to the uterine system."

In a great majority of cases, however, where this has gone to the extent which constitutes a pathological condition, the characteristic phenomena are first manifested during the puerperal period, as in the case that you have just seen.

Dr. Snelling relates, also, the following case, occurring in his practice:

"Mrs. H——, aged twenty-two, primipara, was safely delivered, on the 14th of last August, of a healthy female child, at full term. The labor was short, lasting but eleven hours; the presentation, normal, and delivery was accomplished without accident. The case progressed favorably in every respect until the tenth day after confinement, when she was allowed to leave her bed. She almost immediately complained of the great difficulty of walking, and of the singularly distressing sensation caused by motion in an upright position. I made a digital examination, expecting to find malposition of the womb. I found that there was relaxation of the anterior wall of the vagina, but the womb was high up, and not larger nor heavier than it should be at such a time. I advised rest in the recumbent position, and (the lochia having ceased) injections of alum and water, a pill of two grains of the extract of gentian and one-fourth of a grain of extract of nux-vomica, as a general tonic. At my next visit, two days afterward, having remained the greater part of the time in a recumbent position, she was somewhat improved, but the improvement was but temporary. At a subsequent visit, I found her in tears, all her symptoms and sensations having returned. They were peculiar. There were

vague pains in the pelvis, no particular sense of dragging or weight, none of the train of nervous symptoms which attend uterine displacements; but her main complaint was of the impossibility of walking. She could not tell why, nor for what reason, but she simply could not do it. After dragging herself partly across the room, her sensations became so peculiar and unendurable that she was forced to sit down at once, lest she should fall. Professor Barker, who saw the case in consultation with me, thought that it might be a case of relaxation; and I therefore examined her in an upright position, by grasping the symphysis pubis, from before backward, between the two fingers in the vagina and the thumb upon the mons veneris, and then directing the patient to balance herself first upon one leg and then upon the other. The movement of the bones was distinctly felt, one upon the other, to the extent of a quarter of an inch or more. A girdle firmly applied about the hips relieved her in two months."

Causes.—Scanzoni seems to regard this malady as one which occurs most frequently in women with narrow pelves, and as somewhat analogous to the phenomena which occur normally in many classes of animals, where the size of the fœtus requires a considerable separation of the bones and an enlargement of the pelvic aperture. He says, "that it seems as though the uterus developed in the narrow pelvis, and, being hindered in its ascent, it worked with such force toward the periphery of the pelvis, as to contribute in an important manner to separation of the bones, through the relaxation of the cartilage and ligaments."

This theory seems to my mind wholly untenable, and as not having the good sense and logical force which ordinarily characterize this eminent writer.

To make this explanation valid, the symptoms of this affection should be manifested in the early periods of pregnancy; whereas such an occurrence is very exceptional. Again, the uterus rises out of the pelvis into the abdominal cavity just as soon as the progress of its development demands this change of position, the period being earlier in those with a narrow pelvis than in those with a broad pelvis.

Again, I believe the fact to be, that this malady occurs most frequently in those whose pelves are very broad and capacious at the superior strait. Such, at least, has been my observation. Many of the published reports of such cases do not allude to the size and form of the pelvis; I have studied all the reports of such cases as I can find, with reference to this, and I see that most who do refer to the size of the pelvis, speak of it as normal or more than usually large; but I must add, with the implication, that this feature made the case more remarkable.

In the cases that I have seen, the process of labor, whether unaided, or assisted by art, bore no relation to the case as a cause of the malady. In those reported by authors, where the symptoms of the disease immediately followed difficult labors, it is quite evident that the pathological condition of the tissues of the symphysis must have existed antecedent to the labor.

All authors are agreed in discarding constitutional diseases, such as cachexia or scrofulous dyscrasia, as a cause of the malady.

My belief is, that the serous infiltration and consequent relaxation of the tissues of the symphyses may be due to the mechanical obstruction to the return of the venous blood by the pressure of the presenting part or the fœtal head. In the cases which I have seen

before labor, the patients have had very broad and capacious pelves, and the fœtal head has lain very low in the pelvic cavity during the last months of gestation.

Those that I have seen after confinement, have had the same kind of pelvis, an unusually pendulous abdomen, and great difficulty or impossibility of completely evacuating the bladder, doubtless due to overdistention, during pregnancy, from the same mechanical cause which produced the serous infiltration of the tissues of the symphysis. To this cause is to be ascribed, the irritable bladder, which Churchill and some others have mentioned as frequently attendant on these cases.

During gestation, there is an increased vascular activity of all the pelvic organs, and, no doubt, a certain amount of relaxation of all the pelvic articulations. But the propositions of Martinelli, maintained before the Imperial Academy of Medicine in 1867, that, during pregnancy and labor, the different parts of the female pelvis are movable in a high degree, and that this mobility is not fortuitous, but an indispensable condition of childbirth, are, I believe, altogether erroneous. Such was the accepted doctrine, in the time of Sigault, whose suggestion to divide the symphysis pubis by an operation in cases of difficult labor, was received by the medical world with unparalleled enthusiasm, but is now discarded, with equal unanimity. It has been demonstrated that it would require a separation of the pubic bones to the extent of at least an inch, to gain one or two lines in the antero-posterior diameter.

If the relaxation existed, as a physiological condition, to the extent believed by Martinelli, women could neither stand nor walk in the last weeks of gestation, or for some time after parturition; for this movement in

bipeds requires a solid pelvis, which will not yield or separate by the weight of the body.

The symptoms belonging to this pathological condition have been so fully detailed and illustrated by the cases quoted, that it is needless for me now to formally recapitulate them. But I will detain you by a few remarks in regard to the diagnosis of this condition. The pathognomonic symptom, of course, is the pain produced by attempting to stand or to walk, and, in severe cases, an entire inability to do either. But this pain is very vaguely defined by patients, and I have never seen one who could fix the precise seat of the suffering, until assisted by the examination of the physician. Now, if this pain be associated with vaginal discharges, irritability of the bladder, febrile movements, or any other constitutional disturbance, it is most natural that the difficulty in standing and walking should be attributed to some cause, as cervicitis, endo-metritis, retarded involution, which are very frequent after parturition, instead of a cause which is very rare. I committed this error (and a very stupid blunder it was on my part, for I had seen enough of such cases to put me on my guard) in the case of the wife of a friend and colleague. On the third week after labor, she could not stand or walk, as she could after her previous confinements. There were symptoms indicating that perfect cicatrization of the tissues and involution were not yet completed; and I supposed that her symptoms were due to this condition. Two weeks more elapsed, and the organs in the pelvic cavity seemed perfectly healthy, and not in the slightest degree sensitive to the touch; but it was painful for her to stand, and, in walking, she waddled like a duck, and this caused severe suffering.

I now examined the case more intelligently, and

found that pressure of the symphysis pubis between the thumb and fingers caused precisely the same suffering as standing and walking; and, in changing the weight of the body from one side to the other, there was a distinct and perceptible movement of the pubic bones. There was also tenderness on pressure over the sacro-iliac synchondroses.

On adjusting firmly a strong towel around her hips, she could stand and walk, with but little pain or difficulty. Being a person of great mechanical ingenuity, she made for herself, what she very appropriately termed a "hip-binder," and, after wearing this for a few weeks, all her difficulties in locomotion disappeared. In two subsequent pregnancies, she suffered in the same way in the last weeks of gestation and after confinement; but she did not require that I should tell her either the cause of her troubles or the proper remedy.

In November, 1866, I was called to Philadelphia to see a lady who had been confined eleven weeks before, but who was still unable to walk across the room without assistance, and in whom every movement, while standing, caused severe pain. As she did not get along well after confinement, the physician who attended her was dismissed, and another one was employed. He found some local lesions, and treated her with nitrate of silver injections and various internal remedies, for five weeks, until she would no longer submit to his "operations," as she called them. I adjusted a towel very firmly around her hips, and the surprise of both her husband and herself was very great, when she found that she could walk with comparative ease. I wrote a note to both of her former attendants, informing them of the results of my examination, and the suggestions that I had made, but I received no reply from either.

The following summer, I met this lady walking in front of the Kursaal, at Homburg, and was told by her that all of her troubles disappeared in about three months after I saw her.

Another case which I saw in consultation illustrates how unjustly a young man may suffer in reputation from hasty remarks by an older man of prominence.

A lady, in her third confinement, was attended by a young physician, in whom the family felt much interest and confidence. Both of her previous confinements had resulted favorably, under the charge of an old physician who had recently died. This third labor was perfectly normal, and the lady seemed to be recovering well, until she attempted to get out of bed, when she found that she could not stand. A week and two weeks passed, and, each time the attempt was made, the result was the same.

The case went on to the eighth week after confinement, the patient being perfectly well in all other respects, when an older and much more prominent gentleman was called in consultation, who discovered a hard tumor in the pelvis, which he thought scybalous, as it proved to be. By the use of very large injections, this tumor disappeared, an early cure was promised, and the young man was severely blamed for neglect. Five weeks after this, I was called in, as there had been no perceptible change in her condition. The true nature of the case was easily demonstrated, and was proven by her subsequent recovery after the use of appropriate means—that is to say, the wearing of a "hip-binder."

As to the duration of this affection, if its true character be recognized, and the appropriate means used for its cure, this is generally effected in a few weeks. But, in one case that I have before alluded to, the first

case that I ever saw, the patient could not walk without crutches for several years, although I believe that subsequently she entirely recovered. Several cases, continuing for years, have been reported by authors.

From what I have already said, you will readily infer what the treatment of this affection must be. The object to be secured by treatment is the consolidation of the tissues of the symphysis. This can only be attained by making the articulations of the pelvis fixed and immovable. That compression of tissues promotes absorption has long been a settled axiom in medicine.

During the puerperal period, I think that the patient should be kept in the recumbent position; but, after this time, it is my belief that absorption and consolidation will be promoted by frequently allowing the weight of the body to rest upon the pelvis, and such exercise as the ability of the patient will permit, provided that the articulations be made firm by proper support. In all the cases that I have seen, this has been accomplished by a little ingenuity, in making and adjusting a hip-binder of very strong, coarse cloth.

What is known as Martin's girdle is strongly recommended by several authors. "It consists of a very solid metal ring surrounding the whole pelvis. The spring is an inch and a third broad, padded in the same manner as a truss, both branches or arms of which are directed downward and forward, where they are fastened firmly by a buckle. The apparatus can also be worn during pregnancy, without interfering with the enlargement of the womb or belly." In cases where Martin's girdle causes discomfort or is too heavy, Dr. Snelling suggests the use of a strong, sole-leather apparatus, properly moulded to adjust itself to the shape, and secured in the same manner as Martin's bandage.

As regards the various other remedies which authors have suggested and tried, such as vaginal injections, cold baths, cold douches, stimulating frictions, certain mineral waters, and various internal medicines, I do not see how they can have any more effect in consolidating the tissues of the symphysis than they would have in promoting the reunion of fractured bones.

I shall close this lecture by quoting, from Dr. Snelling's essay, the description of another form of disease of the pelvic articulations, incidental to the puerperal state, but which I have never seen except in one case, where it was one of the sequelæ of puerperal fever:

"Suppurative inflammation, with its attendant dangers, frequently sets in and carries off the patient in spite of all that care or skill can do, after the most protracted and agonizing suffering; and, furthermore (what would seem at a first glance an actual impossibility), rupture of the symphysis may take place as a crowning result.

"The first of these; viz., suppurative inflammation, has been treated of by Hiller, Monod, Danyau, Hayn, and others. It may arise either before or after labor, as in the case of simple relaxation, and its earlier symptoms are very similar; viz., pain in the symphyses, of varying degree, greatly aggravated by movement, and sometimes intermittent; crawling and pricking, and occasionally numbness in the lower extremities, and tottering and, uncertain gait. The gait varies according to the part affected; and, in one case, a woman could only walk with bent knees dragging the feet over the floor, without the ability to raise them in the least.

"When the pubic symphysis is the point affected, dysuria is apt to be present; and, where the sacro-iliac symphyses are the seat of inflammation, there are tenes-

mus and pruritus, especially during defecation. On the occurrence of suppuration the symptoms assume a gravity which should put the accoucheur on his guard. Fever, followed by rigors, sets in, the patient's countenance is expressive of anxiety, the tongue becomes furred and the bowels confined, together with the other symptoms of the inflammatory condition. The case assumes, in fact, the aspect which is peculiar to suppurative inflammation in the cavity of a joint; and, of course, the prognosis is eminently unfavorable. Death may occur, indeed, before suppuration sets in, but, if this occur, extensive abscesses are formed in various parts. If it be the pubic symphysis which is affected, pus forms about the mons veneris, and burrows along the vagina and down into the thighs. If of the posterior symphyses, of which the right is more often affected than the left, it may cause purulent collections in five different places; viz., directly upon the joint, in the gluteal region, in the lumbar region, in the pelvic subperitoneal pouch, and, lastly, near the rectum, whence it may spread to the gluteal region, to the greater trochanter, or to the horizontal ramus of the pubes. Caries of the bones may take place, and it then runs a tedious course, and invariably ends in death. Anchylosis seldom takes place. The cartilages are loosened, and the soft parts infiltrated with serum, pus, and ichor.

"Its diagnosis is not difficult. In distinguishing between it and simple relaxation, it should be borne in mind that, in consequence of the inflamed condition of the symphyses, the difficulty of walking stands in direct relation to the intensity of the pains, and that, in general, the patient has more control over the lower limbs, in consequence of the bones being still held in place by the inflamed cartilages; and especially does this

hold good when the inflammation is confined to one symphysis. The vaginal touch, the imposition of the hand upon the affected points during movement of the patient, and the probe, after the evacuation of abscesses, will be found sufficient to establish a diagnosis.

"The treatment should be directed primarily against the inflammation and the collection of pus, and rest in the recumbent position should be enjoined. After the subsidence of the inflammation, a pelvic bandage should be worn for a lengthened period.

"In slight cases, the affection may be so insignificant as to be confounded with the general results and inconveniences of the lying-in state, attracting no particular attention, and pass off with rest and quiet. In others, it may be so severe as to call for some treatment, though generally it is not even then that its true nature is recognized, as the patient recovers after a few weeks of discomfort and confinement. But treatment should be prompt and decided, even in these cases, lest there should ensue the deplorable results which various authors have reported."[1]

[1] While these pages are passing through the press, I had an opportunity of examining in the Bellevue Hospital (November 14, 1873), a case of relaxation of the right sacro-iliac synchondrosis, in a patient at about the eighth month of pregnancy. This occurred in the service of my colleague, Professor William T. Lusk.

LECTURE XII.

PHLEGMASIA DOLENS.

Case—Symptoms—Progress—Duration—Usually terminates by resolution—Phlegmonous suppuration sometimes occurs—Phlebitis, a secondary phenomenon of this disease—Suppurative phlebitis, very rare, and generally fatal—Sometimes terminates in embolism of the pulmonary arteries and speedy death—Gangrene, an exceedingly rare termination—Former doctrines as to the pathological nature of this disease—The discovery of Professor Davis, that the femoral and iliac veins were obstructed by clots—Theory that the disease is primarily a crural phlebitis—The theory of Dr. Robert Lee, that the phlebitis originates in the veins of the uterus—Phlegmasia dolens not peculiar to the female sex, or to the puerperal state—Frequent, in association with cancer, and occurs occasionally in many other diseases—Inopexia, a condition of the puerperal state, as well as of all diseases in which phlegmasia dolens occurs—Thrombosis, meaning of—Doctrines of the most recent authors on this disease—Hervieux—Mackenzie—Simpson—Tilbury Fox—Objections to the doctrines of each—Case of crural phlebitis terminating fatally, in which there was no phlegmasia dolens—A second case, in which phlegmasia dolens was absent—Thrombosis does not generally produce phlegmasia dolens—Is not the thrombosis an effect instead of a cause of phlegmasia dolens?—Treatment.

GENTLEMEN: I purpose to discuss to-day one of the puerperal diseases which is not very unfrequent. We have had a case in the hospital which I hoped to have had an opportunity of showing to you to-day, but, unfortunately, I can show you only its autopsical results:

"CASE XIV.[1]—January 25, 1866; E. C., aged twenty-four; Irish, domestic, married. Fell in labor with her first child, at 5 P. M., January 23, 1866. Before the membranes had ruptured and the os had

[1] Reported by William Hunter Birkhead, M. D., house-physician to Bellevue Hospital.

become fully dilated, a face-presentation was recognized, engaged in the right mento-iliac position. The labor, though tedious, ended successfully on the 24th, at 8.28 A. M., in the delivery of a female child weighing eight pounds. No untoward circumstance manifested itself until the morning of the fifth day subsequent to confinement, and at this time she complained only of a severe pain in the calf of the right leg. No pain existed either in the popliteal or the inguinal regions, and no induration of the vessels could be discovered. The leg was not œdematous. Before the occurrence of these symptoms, she had slight indications of milk-fever, but the secretion of milk was well established. The pulse was now somewhat increased in frequency, though the skin was cool; and the lochia continued healthy, both as regards quantity and quality. No chill preceded the pain. The urine, which had been several times examined previous to confinement, and found free from all evidences of renal disease, was not now again tested. The limb was dressed with ung. stramonii, covered with cotton, and the whole enveloped in oiled silk. At the same time, it was elevated at an angle of about 30°, by raising the lower half of the mattress. Before the application of the ointment, iodine was freely applied along the course of the vessels. Quinine, eggs, and milk, and an opiate at night, constituted the remainder of the treatment. The following day (January 29th) there was considerable febrile reaction; the patient seemed more oppressed, the pain was increased, and the leg, very much swollen. No evidence of peritoneal or uterine irritation was noticed. At the evening visit, she was found to be quite delirious; face flushed, pulse 130, skin hot and dry; gtt. xv. of Magendie's solution of morphia in ℥ ij of whiskey caused her to sleep the remainder of the night, and in the morning she appeared much more comfortable. The bowels were at this time regular, and the urine copious.

"*February* 1*st*.—No change for the better or worse was apparent in the morning. The pulse during the day rose to 140, and she became dull and perspired freely. A small patch of erysipelatous inflammation now appeared on the back of the left hand, while the pain in the leg became less severe. Urinary secretion free. The lochia were somewhat fetid. She now received ℥ xij of whiskey, four eggs, three pints of milk, and grs. xvj of quinine daily. Opiates were administered at night in sufficient quantity to produce sleep. Applications to the limb were continued as before. Vagina was ordered to be syringed morning and evening with

diluted "Labarraque's solution," two tablespoonfuls to a pint of tepid water. On the 2d, the pulse, though still weak, fell to 120. Other conditions remained about the same. Patient passed nearly ℥ xl of urine during twenty-four hours.

"*February 3d.*—Pulse has again run up to 140; patient seems to be failing rapidly. Sleeps most of the time, and is with difficulty roused. Abdomen moderately tympanitic, but pressure elicits no evidence of pain. Lochia and milk continue, urine still copious, of a dark amber color. By direction of Dr. Barker, it was again examined, and found to have a specific gravity of 1020. Heat and nitric acid now coagulated about one-third of the urine; and the microscope revealed an abundance of highly-granular and a few fatty casts. The œdema in the left leg is very decided, but none appears in other parts. At 4 P. M., the pulse is 150, and at 5 P. M. she died.

"Autopsy twenty-two hours after death. Abdomen highly tympanitic. On turning back the abdominal parietes, the stomach was seen distended to thrice its natural size, and its cavity contained about a pint of greenish fluid, consisting, most probably, of decomposed eggs and milk. Peritonæum and uterus did not present the slightest evidence of inflammatory action, nor was there any pus discoverable in the lateral ligaments or in the uterine walls."

I shall now pass around the room, for your examination, the uterus, both kidneys, and a part of the right femoral vein. The uterus "is of a firm consistence—weight one pound ten ounces, avoirdupois. Kidneys much congested, and, under the microscope, a certain amount of dark, granular matter is found in the cells. They weighed together ℥ xj, avoirdupois. The other abdominal and thoracic organs presented no deviation from the healthy standard. The right femoral vein, at point of union with the internal saphenous, was found occluded by a clot of soft consistence and stringy in character. No clots were found in the adjacent vessels. The walls of the vein were much thickened, and, from its cut extremity, a considerable amount of pus could be squeezed out. Its inner surface presented one point

which seemed due to ulceration, while, in various parts of its course, what appeared to be lamina of false membrane covered its internal coat. The areolar tissue surrounding the vessel was infiltrated with serum. The leg itself was œdematous."

Before discussing this case, which presents many interesting and some very rare features, I shall detain you by a few general remarks on the disease which has long been recognized and described under different names, but is now generally known as phlegmasia dolens, or phlegmasia alba dolens.

Symptoms.—The prominent symptoms of this disease are the following:

It usually commences between the tenth and twenty-first day after confinement; but, in a small minority of cases, it has been manifested both at an earlier and a later period. It is very rare, however, that the first symptoms have appeared after the end of the month.

Pain, either in the calf of the leg, the popliteal space, the thigh along the tract of the femoral vein or its principal branches, is usually the first symptom. This pain is increased by pressure and by movements of the affected limb, which is sometimes impossible for the patient. Both legs may be affected, but it is never developed in the two simultaneously—that is, the same day—although the interval is sometimes short between the attack of the two legs. It is the left leg which is the most frequent seat of this affection, in about the proportion of three to one. Various explanations of this fact have been suggested by authors. The most plausible of these theories is, that it is due (1) to the position of the rectum on the left side, which must necessarily excite more or less pressure on the veins of that side, and (2) to the arrangement of the arterial

and venous trunks at the promontory of the sacrum, where the primitive iliac vein is crossed almost transversely by the right common iliac artery. It has been found, in autopsical examinations, that, where the iliac vein contains a clot, a very marked depression is observed in the clot, at the point where the artery crosses the vein. Some obstetrical writers have suggested that this may be the result of the more frequent occurrence of the left occipito-iliac position in labor; but, as, in this position, it is not the longitudinal, but the transverse diameters of the fœtal head which press upon the veins of the left side of the pelvis, if the process of parturition had any influence in causing this disease, it ought to be found more frequently in the right leg than in the left.

Swelling of the part affected is a constant and one of the most prominent features of this disease. The pain usually precedes the swelling by some hours, but in many cases these symptoms are observed simultaneously, or it is difficult to decide which has appeared first. The patient naturally first notices the sensation of pain; and, in some instances, when this has been complained of, I have made a most careful examination, and found no swelling, although it became very apparent a few hours subsequently.

Many authors, as Puzos, Levret, White, Gardien, and others, assert that the swelling begins at the upper part of the leg and gradually descends toward the foot. Trousseau declares that he has never seen the swelling progress in this direction, but that it always begins at the lower extremity and ascends toward the pelvis. My own experience is in accord with that of Bouchut and some others, that neither assertion is absolutely true, but that in some cases the swelling begins below

and advances upward, while in other cases exactly the reverse occurs. In one lady, the swelling, which was very great, was confined entirely to the thigh, and, at all times during the course of the disease, a shoe of the same size could be put on either foot.

The swelling is generally very considerable, sometimes doubling the size of the limb. The skin is white, glistening, and so elastic, that most authors have asserted that the swelling does not pit on pressure. This is true if the finger be pressed on the swollen part only for a moment, which is sufficient to leave the pitting in ordinary œdema, but I have often demonstrated at the bedside, that if the pressure be made with some force and prolonged for a minute or two, the pitting is then as manifest as in any œdema.

Loss of all muscular power of the limb is another characteristic of this affection. In some, not only is it impossible to move the thigh or the leg, but also to flex or extend the toes. This immobility is sometimes the result of great pain in the articulations, produced by motion, but in other cases it seems like a *quasi* muscular paralysis, as passive motion does not cause pain.

In some patients, hard, knotty, painful cords can be traced along the course of the crural vein or its branches, but, in others, the most careful examination will fail to detect any such cords.

There is a great discrepancy of statement as regards the temperature of the affected limb. Valleix, Graves, and Simpson, assert that there is an increase of temperature where the swelling exists; but Trousseau denies that this disease produces any modification of temperature in the part affected. By applying the hand to the surface of the swollen part, I have rarely been able to

decide that there was greater heat than in the limb which was not affected, but the question as to temperature will now soon be positively determined by the use of Dr. Seguin's surface-thermometer, and I have no doubt that important points, affecting the diagnosis and treatment of this disease, may result from the use of this instrument.

The constitutional symptoms are by no means uniform. In some, the local symptoms are suddenly manifested, with no prodromic indications of constitutional disturbance. But, in most cases, there are one or more chills, with febrile reaction, a rapid pulse, loss of appetite, and a general condition of *malaise* and depression before the patient begins to complain of the pain and swelling of the leg. The tongue is usually moist and covered with a white coat, the face is pale, the countenance anxious, and there is a great tendency to frequent and profuse perspiration. The function of lactation is generally very much impaired, and sometimes wholly arrested by the development of the disease.

The lochial discharges seem, in many cases, to be very little influenced by the onset and progress of this disease, but, in others, they have been observed to become very fetid and offensive.

Some authors have mentioned, as occasional symptoms of this malady, nausea, vomiting, delirium, and excessive depression of the vital powers, and all these existed in the case which you have just heard read; but they are the symptoms of the consecutive or the coincident phlebitis and pyæmia, and are never found in uncomplicated phlegmasia dolens.

Progress and Duration.—We have seen that in the commencement of this disease the development of symptoms is very rapid, but those of its disappearance

are very much slower. The usual termination is by resolution. The general symptoms of constitutional disturbance gradually subside, and the disease remains as purely a local malady. The pain decreases day by day, passive movement can be made without suffering, and in a little time the patient recovers the power which had been lost. The elasticity of the skin rapidly becomes less, as is shown by the fact that, before any decrease in size is manifest, the pitting on pressure is very much more marked, and is evident even when the pressure is but momentary. Resolution has now commenced, and is followed by absorption of the fluid effused in the cellular tissue, and the restoration of the impeded venous circulation. The hard, knotty cords, along the tracts of the veins little by little diminish in size, firmness, and sensibility, until they can no longer be detected.

In favorable cases, these results are generally attained in three or four weeks. But, in others, months elapse before all the consequences of this affection disappear. The limb remains feeble and enlarged, with pronounced œdema toward evening, if the patient have been on her feet during the day. In some, no doubt, there occurs a permanent obliteration of the venous trunk, which is transformed into a mere fibrinous cord. The affected limb remains weaker, with a great tendency to swell, and this state continues for years, or even for life. This condition existed in both legs, in the wife of a very eminent general officer of the army, a patient of my friend, Professor Metcalfe. Before coming under his care, she had phlegmasia dolens in one, and then in the other leg, in two successive confinements. I found the same condition also in a lady sent to me by Dr. Pitcher, of Detroit. The œdema of both legs was very great

after walking for a little distance, and both pain and œdema of the legs were constant phenomena during her menstrual periods.

In rare cases, phlegmonous inflammation of the connective tissue is developed, which terminates in suppuration. I have known large abscesses form in the calf of the legs and the thigh, and in one patient, who, as my service terminated, passed under the charge of my colleague, Professor Lusk, the amount of pus discharged was enormous, and she subsequently died from the effects of the disease. When the phlegmon is circumscribed, a favorable result may be confidently anticipated; but, when it is diffused, involving a great extent of tissue and vast suppurations, all treatment seems powerless to avert a fatal termination.

The case I have just had in my service, the history of which you have heard and the autopsical results you have seen, was associated with an exceedingly rare but most fatal complication, suppurative phlebitis. You see the soft, stringy clot that occluded a portion of the right femoral vein. The walls of the vein are very decidedly thickened. Various parts of its internal coat are covered with flakes of false membrane, and in one point it seems to have been destroyed by ulceration. From the cut extremity of the vessel, pus can be squeezed out in considerable quantity. The pus was mingled directly with the blood in its circulation, and you observe that the symptoms which preceded the death of the patient were those of purulent infection.

This disease may also terminate in another formidable manner. A fragment of the clot which occludes the vein may become detached, carried into the circulation, and lodged in the pulmonary artery. Although I think that we have good ground for believing that pa-

tients do sometimes recover after the occurrence of this event, yet it is probable that the most frequent result is death within a short period. But this topic is so important that it will form the subject of a special lecture.

Another very rare termination mentioned by authors is gangrene; but, as I have never seen this result, I shall allude only to its possible occurrence.

Pathology.—I shall not occupy your time with a discussion of the opinions of the past as to the nature of this affection. I shall only say that the belief of the earliest writers on this affection was, that it was due to a metastasis of the milk from the breast to the leg.

The next doctrine, which was sustained by many partisans, half a century ago, and still finds supporters at the present day, was, that it is essentially an affection of the lymphatic system.

The belief that the disease is due to suppression of the lochia, which was subsequently determined to the affected limb, was held by a few, but soon proved to be groundless. Some eminent writers in the past have regarded the disease as arising from inflammation of the nerves. Others, again, have advocated the doctrine that it is in reality an inflammation of the cellular tissues of the affected limb.

Our own Dewees, and some others, finding it impossible to explain the symptoms by any one of these exclusive theories, arrived at the conclusion that it is due to inflammation of all of the tissues.

The first great step made in advancing the knowledge of this disease, from speculative theories to the domain of pathological science, was by Dr. Davis, Professor of Midwifery in University College, London, who, in 1823, published his discovery that, in several

instances, he had found, in making post-mortem examinations in this disease, that the femoral and iliac veins were impermeable from being filled with firm coagula of blood. This, which, at the time, must be deemed a discovery of immense value, was very soon after confirmed by the published observations of Bouillaud and Velpeau, of Paris.

From this discovery resulted the doctrine of crural phlebitis, which, as you will presently see, is still held to be the true theory of the disease by some of our most able and recent writers.

A few years later, in 1829, Dr. Robert Lee, of London, believed that he had made a great discovery; viz., that the disease is primarily a uterine phlebitis; that is, that it commences in the uterine branches of the hypogastric veins, and is subsequently propagated to the iliac and femoral trunks of the affected limb.

But, as observations of this disease accumulated and were published, it was found that this is not a disease peculiar to the puerperal period, or to the lower extremities, or even to the female sex. It was observed that it is often associated with other diseases, as you will see cases published in which it has occurred in connection with phthisis, chlorosis, erysipelas, typhus fever, dysentery, or perineal abscess, and, more frequently still, in cases of cancer. Virchow has published several observations of cancer of the stomach, in which this disease occurred—in some, in the upper extremities, and in others in the lower limbs.

In October, 1870, I visited, in consultation, a lady fifty-two years of age, with most characteristic phlegmasia dolens of the left leg. She was cachectic, and, notwithstanding the absence of all other signs, I ventured to make the diagnosis that the phlegmasia dolens was

due to cancer. In the course of a few weeks, the leg got entirely well, but the correctness of my diagnosis has been verified by the subsequent development of cancer in the pelvis.

The knowledge that this disease is not confined exclusively to the puerperal state or to the female sex was a great step in elucidating its pathology.

The next advance was made by the hematologists, Andral and Gavarret, and Becquerel and Rodier, who demonstrated the existence of a peculiar modification of the blood in the cachexias, and that this modification often exists in pregnancy. This consists in a change in the proportion of the elements of the blood. There is an excess in the amount of fibrine and serum, and a deficiency of the blood-corpuscles, as compared with the normal state, and the term *hyperinosis* is used to define this condition. In this state of the blood, there is a special predisposition to coagulation.

I should not omit to say that it is asserted that this special tendency to coagulation has been sometimes found to exist where the physiological proportions of the constituents of blood are not changed from the normal state.

This abnormal tendency to coagulation of the blood has been denominated, by Vogel, *inopexia*, ις, ινος, fibrine, πῆξις, coagulation, and the term, a very appropriate and significant one, is now adopted in science. Now, it is known that whenever phlegmasia dolens occurs, whether in the puerperal period or in association with other diseases, there is inopexia.

That my subsequent remarks may be perfectly understood, I shall explain the meaning of another term, that I shall have frequent occasion to use. When this tendency to coagulation, or inopexia, exists, and the cir-

culation is blocked by the formation of a clot in the vein, this lesion is now termed *thrombosis*.

If you ask me what is the accepted doctrine of science at the present day, as to the nature of the functional changes and structural lesions which constitute phlegmasia dolens, I am compelled to answer that the question is not yet settled.

The latest book which has appeared on puerperal diseases is by M. Hervieux, physician to the *Maternité* Hospital of Paris, a very large book, and richer in its clinical illustrations of these diseases than any published since the great work of Mauriceau, and the author is evidently a most conscientious observer, who has had exceptionally large opportunities for studying these affections.

M. Hervieux regards this disease as a phlebitis of the crural vein and its branches, excited by a puerperal toxæmia, and that its nature is now perfectly settled. While he gives an historical abstract of the various opinions which have been formerly held, he says, "God forbid that I should reopen a discussion which has long since been closed!"

Now, as Providence does permit me to reopen this discussion and to comment upon this view of Dr. Hervieux, which is so confidently asserted, I shall first remark, that it seems to me that two elements are absolutely essential to constitute the true theory of any disease: (1) that the assigned cause or condition should always be present when the disease exists; (2) that the disease should always exist when the assigned cause is present in its full development. I think all theories of disease should be brought to the rigid tests of such a standard.

In the case, the history of which has furnished the

theme for my remarks to-day, phlebitis did exist. The characteristic and constitutional symptoms of this disease and of purulent infection were manifest during life, and the autopsical lesions demonstrated the phlebitis. But such a combination of symptoms is exceedingly rare in phlegmasia dolens.

As a rule, phlegmasia dolens is not accompanied with symptoms of great constitutional disturbance, and all the symptoms of this character pass off in a few days, while there remain only those of a purely local disease. But it is not so with phlebitis, which, throughout its whole course, even when it terminates in recovery, is attended by constitutional symptoms of a marked type, which I shall fully describe in my lecture on that subject. We have no reason for assuming the existence of any disease when its characteristic symptoms are not present. Phlegmasia dolens generally terminates in recovery, while this result is very far from being the rule in phlebitis.

As death from uncomplicated phlegmasia dolens is a very rare occurrence, we cannot prove by numerous autopsical examinations that phlebitis is generally absent. But I think the number of cases of well-marked phlegmasia dolens, in which death occurred and the veins were found to be perfectly healthy, reported by such observers as Rigby and Hugh Fraser, of England, Jacquemier, of France, Casper, of Leipsic, Kiwisch, of Würtzburg, and others, is sufficient, in connection with the fact of the general absence of the symptoms of phlebitis, to prove that phlegmasia dolens is not crural phlebitis. Those of you who heard me last winter on the subject of puerperal embolism will remember the patient who died very suddenly from this cause. In this case, there had been phlegmasia dolens, and we

found thrombosis of the femoral and saphenous veins, but not the slightest disease of the veins could be detected, nor had the patient during life any symptoms of phlebitis.

Again, on the other hand, we may have fully developed phlebitis of the crural vein and its branches, without phlegmasia dolens. I have just had in my service in this hospital two cases which demonstrate the truth of this assertion:

"CASE XV.[1]—Rachel Greenstein, aged twenty-four; single; born in Germany; was delivered of twins, December 30, 1868. The patient was a primipara. Her labor was quite tedious, the first stage continuing between two and three days. Soon after delivery, her pulse became quite feeble and rose to 96. Respiration 40; tongue furred; lochia free; skin dark and cold. She complains of constant pain in the hypogastrium. Uterus hard. No abnormal signs could be detected in connection with the heart and lungs.

"*December 31st.*—Patient has fever and abdominal pain. Pulse 120; respiration 60; temperature 104°; tongue brown and coated; lochia profuse; bowels loose. Had several chills during the night and morning. She was ordered a tablespoonful of liq. ammon. acet. every hour, and morphine enough to quiet the pain.

"*January* 1, 1869.—Pulse 130; respiration 50; temperature 105.5°; tongue dry; profuse diarrhœa. Ordered four grains of quinine three times a day, and ten grains of the subcarbonate of bismuth after each movement of the bowels. Morphine p. r. n.

"*January 2d.*—Pulse 140; respiration 60; temperature 105.5°. The patient has profuse perspirations. Countenance dusky and sunken. Tongue very dry. Abdomen tender and tympanitic. Diarrhœa continues. Complains of pain in the calf of the right leg, but there is no swelling or œdema that can be detected. Dr. Barker first saw her to-day, and ordered the sulphite of soda, in the following prescription:

℞. Sodæ sulphitis,	ʒ ij.
Syrup. simp.,	ana ʒ iij.
Aquæ,	ʒ j.

M. S. A tablespoonful every four hours. Also a half-ounce of whiskey every hour. Morphine as before.

Reported by W. J. Chandler, M. D., house-physician to Bellevue Hospital.

"*January 3d.*—Pulse 140; respiration 40; temperature 103°. Diarrhœa still continues. Discharges very black and fetid. Tongue more moist. A small swelling discovered over the seat of pain in the right leg. The sulphite was discontinued this evening, and the bismuth was ordered in twenty-grain doses after each passage. Whiskey to be continued as before.

"*January 4th.*—Pulse 120; respiration 30; temperature 103°. Diarrhœa subsiding, but abdomen still tender and tympanitic. Abscess forming in the calf of the right leg. Treatment continued. Ordered a lead-and-opium wash to be applied to the limb.

"*January 8th.*—Pulse 120; respiration 30; temperature 103°. Patient has continued about the same since last date. The diarrhœa has nearly ceased. Several abscesses are forming along the course of the saphenous vein.

"*January 12th.*—Pulse 110; respiration 25; temperature 100°. Patient improving. Mind cheerful and clear. Diarrhœa stopped. A chain of abscesses formed along the inner aspect of the thigh and leg, some of which opened and discharged a bloody and offensive purulent fluid. The tympanites and abdominal tenderness very much diminished. The limb is dressed with the hospital lotion of carbolic acid and linseed-oil. Her general condition is very much better. Appetite good, and she now nurses her child (one had before died). She takes quinine and iron, and the best diet of the hospital.

"*January 25th.*—Thrombosis in the left calf. Patient has had three attacks of diarrhœa since last date, each of which lasted two days. She has also had several chills, followed by profuse perspiration. Pulse 112; respiration 25; temperature 103°.

"*February 1st.*—Patient was found sitting up in bed. Feels well and much stronger. Pulse 104; respiration 22; temperature 100°.

"*February 9th.*—A large abscess was opened in the left calf, and about two quarts of pus discharged. The patient transferred from the convalescent puerperal to the surgical wards.

"*February 19th.*—Patient has been steadily growing worse since last date. She is much emaciated and very weak. Appetite poor. She has profuse sweats and a pyæmic odor. The diarrhœa has returned, and, in addition, she has a troublesome cough, with a scanty expectoration of white frothy sputa. Pulse 124, feeble and compressible; respiration 30. Examination of the lungs revealed only an occasional mucous or sibilant *râle*. She has quinine, iron,

and stimulants, with extra diet. The patient continued to fail, and died, February 27th.

"A complete autopsy could not be made, as her friends would not consent. Permission, however, was granted to open the veins of the legs. In both legs, were found conclusive evidences of phlebitis, most marked near the seat of the thromboses. The coats of the femoral and saphenous veins were much thickened and reddened, and, at spots, infiltrated with pus."

Now, this patient had no phlegmasia dolens during any period of her disease. Neither was there phlegmasia dolens in the following case, the history of which is also given by Dr. Chandler. The patient has now quite recovered:

"Case XVI.—Winifred Sears, aged twenty-eight; single; was delivered of her first child, December 28, 1868. The labor was natural and easy, and the patient was doing well in every respect, until the morning of the 30th, when she had a chill. The pulse was 136, irregular and feeble; the respirations were forty per minute; and the temperature in the axilla, 103°. She complained of no pain, but had a general feeling of uneasiness, and her countenance was haggard and sunken.

"*December* 31*st.*—Pulse 130; respiration 52; temperature 103.5°. Chills repeated, followed by profuse perspiration. The patient complains of severe pain at the precordia, and also a little in the calf of the right leg. The stethoscope revealed an aortic obstructive murmur. The veins of the leg are enlarged, at points, quite tender on pressure, and the thigh is slightly swollen.

"*January* 1, 1869.—Pulse 132; respiration 36; temperature 104°. Chills as usual. Pain and tenderness, with several points of redness along the inner side of the thigh, which is more swollen and slightly œdematous. The leg was wrapped in cotton-wool and oil-silk. Dr. Barker saw the patient for the first time, and ordered four grains of quinine, and twenty drops of the tinc. ferri chlorid. four times a day. Also a half-ounce of whiskey every second hour, and the most nutritious diet the hospital affords.

"*January* 2*d.*—Pulse 112; respiration 40; temperature 103°. Chills again. Abscesses beginning to form along the inner course of the thigh, and one just below the knee.

"*January 3d.*—Pulse 120; respiration 36; temperature 102°. Patient much the same.

"*January 4th.*—Pulse 80; respiration 36; temperature 100°. One of the abscesses just below the inner condyle of the femur was opened and discharged a large quantity of sanious pus. It was dressed with the hospital solution of carbolic acid and linseed-oil (one part of the acid to seven parts of oil). Patient looks better, and complains much less of pain.

"*January 8th.*—Pulse 100; respiration 30; temperature 99°. No chills to-day, for the first time. A second abscess opened in the thigh. The first abscess is in process of healing. The whole thigh is much swollen, pits on pressure, and is exquisitely sensitive.

"*January 25th.*—The fifth abscess discharged itself to-day. There are yet two more on the upper and inner side of the thigh.

"*January 31st.*—The last of the abscesses broke to-day. The patient feels much relieved from pain. She has had no medicines during the whole of her illness, except those above mentioned, which have been steadily continued, with morphine to relieve pain, which at times has been horribly severe.

"*February 20th.*—The patient has steadily improved since last date, and is now walking about the wards."

I think that every one will agree that this was a case of thrombosis, with suppurative phlebitis, but I am quite sure that no one, seeing the case, would ever think of calling it phlegmasia dolens. And so I must conclude that phlegmasia dolens is not crural phlebitis. They may occur together, but either may exist, in its full, typical development, without the other.

The most recent elaborate discussion of the pathology of phlegmasia dolens, in the English language, is by the late Sir James Y. Simpson. His doctrine is that phlegmasia dolens does not arise from phlebitis properly so called, but is immediately due to obstruction of the veins by coagulated blood, and any resulting phlebitis is a secondary consequence only.

He says: "This coagulation of the blood and obstruction of the veins may, in their turn, depend on one

or other of two causes; viz., either, first, on some morbid alteration in the blood itself, tending to its consolidation or coagulation; or, second, on some morbid condition in the lining membrane of the veins, in virtue of which the relation between the blood-vessels and the blood becomes disturbed, and coagulation of the latter is induced. I believe that in some cases of phlegmasia dolens this required morbid condition in the lining membrane of the veins may be primarily due to phlebitis, as where the veins of the uterus have been inflamed, and the inflammation, having extended, by continuity, to the iliac vessels, has led to coagulation of blood in the veins below. But, in the great majority of cases, it seems to me that we must look for the primary cause of the disease in some morbid condition of the circulating fluid, leading, first of all, perhaps, to some peculiar change in the lining membrane of the veins, and, through this, secondarily, to coagulation of the blood, occlusion of the vessels, and obstruction to the limb."

The pathological views of Professor Simpson seem to be wholly based on the experiments and deductions of the late Dr. Mackenzie, of London, whose essay on "The Pathology of Obstructive Phlebitis, and the Nature and Proximate Cause of Phlegmasia Dolens," and whose Lettsonian lectures were most valuable contributions to our positive knowledge on this subject. Professor Simpson says: "From all Dr. Mackenzie's observations and experiments, therefore, it seems probable that phlegmasia alba dolens is essentially due to the presence of a morbid material circulating in the blood and exerting such an influence on the internal surface of the veins as leads to consolidation or coagulation of the blood which they contain." He refers to the blood

as being in the condition described as hyperinosis, and adds: "In the puerperal patient matters are rendered still more complicated, and the proclivity to disease still further increased by the circumstance, that in her constitution great and important changes are at the time taking place, such as the degeneration and the resorption of the hypertrophied uterine mass and the establishment of the new mammary secretion, in consequence of which the blood becomes loaded and deteriorated by the introduction of a quantity of effete organic material. In short, the blood is so altered as to render the patient peculiarly liable to spontaneous coagulation of blood in the blood-vessels, or, as it has been called, thrombosis, and all its consequences."

I was very much impressed by the writings of Dr. Mackenzie, and studied them with great care. I think he has conclusively proved (1) that crural phlebitis, in a pure and uncomplicated form, cannot give rise to all the local and general phenomena of the disease, and therefore cannot be its proximate cause; and (2) that phlebitis itself is for the most part not a primary, but a secondary affection, and, in the great majority of cases, is a consequence of the circulation of impure or morbid blood in the veins. But I cannot accept his deductions and the theory so elaborately argued by Professor Simpson, as an adequate explanation of the pathology of phlegmasia dolens.

You see, the theory may be thus tersely stated: Inopexia is the predisposing cause, and toxæmia the exciting cause of venous coagulation, which produces the disease known as phlegmasia dolens. It practically implies that all the phenomena of phlegmasia dolens are due to the arrest of the circulation in the veins. This doctrine was first enunciated by Bouchut, in 1844.

Now, let us examine this for a moment. Simpson says: "Several experimenters have tied the femoral vein and have succeeded in producing obliteration of it in many different ways, but without producing any of the peculiar phenomena of phlegmasia dolens. No increase in the heat of the limb has resulted, and no tension, tenderness, or impaired mobility; nothing further than a slight degree of œdema, partial and passing." He refers to a case which was carefully watched by Dr. Moir, of Edinburgh, and himself, in which there was not a symptom in the least degree approaching to phlegmasia dolens, but in which it was found that the femoral vein was obstructed with coagulated blood to the extent of two inches below Poupart's ligament. While, therefore, admitting that thrombosis in the largest veins of the limb is not sufficient to produce the phenomena of this disease, he believes that, "if this coagulation extends to the branches of the third or fourth order of size as well, we shall then have something more than mere œdema, but the heat, swelling, tension, and paralysis, characteristic of phlegmasia dolens in a very marked degree."

I cannot see that there is any adequate or decisive proof of this assertion, furnished either by the experiments of Dr. Mackenzie or by clinical observations. I believe, with Sir James Simpson, that, if coagulation and obstruction of blood in the veins existed to the extent that this theory implies, there would be something more than mere œdema resulting, and I will add, something more than phlegmasia dolens. I cannot see how the obstruction of blood in numerous veins of this calibre could be removed, and terminate in reëstablishment of the circulation and recovery in a few days.

According to this theory, phlegmasia dolens ought

to be a common result of thrombosis; but the fact is, that, while thrombosis is one of the common phenomena of phlegmasia dolens, the converse of this is very rare. Phlegmasia dolens is an exceptional phenomenon of thrombosis. I could give you numerous examples which have been published, where the thrombosis has extended even to the smallest veins, in which there was no phlegmasia dolens.

The relation which the thrombosis bears to phlegmasia dolens seems to me to be that of an effect rather than a cause; for I have often observed and pointed out to my staff in this hospital, the first development of the knotty, cord-like veins, two or three days after the disease had existed in its highest degree.

In a very able and interesting paper, in the Transactions of the London Obstetrical Society, by Dr. Tilbury Fox, the objections to the theory of Mackenzie and Simpson are presented, with a train of reasoning, somewhat similar to that which I have urged; but Dr. Fox seeks to explain the phenomena of phlegmasia dolens, by the theory of lymphatic thrombosis. He gives a summary of his views in seven propositions, the first four of which are so in harmony with the opinion that I have expressed, that it is unnecessary for me to quote them. The fifth, sixth, and seventh, are as follows:

"5. Obstruction of the main lymphatic channels alone is capable of giving rise to white leg, and acts by preventing the removal of lymph from the affected limb.

"6. The obstruction may be the result of, *a*. Extensive pressure. Ex. tumors of all kinds. *b*. Thrombosis, due to sudden (compensatory) absorption of vitiated fluid after sudden loss of any kind.

"7. Inflammatory changes in the vessels themselves."

Many authors before have sought to explain the pathology of this disease by some abnormal condition of the lymphatic vessels, some referring it to rupture of these vessels at the brim of the pelvis, allowing of the escape of lymph into the cellular tissue and its gravitation downward into the limb; while others have regarded it as due to obstruction of the lymphatic glands; and others have ascribed it to inflammation of these vessels and glands.

The pathology of the lymphatic system in connection with the puerperal state is now receiving much more attention than formerly; and puerperal lymphatic thrombosis is now a recognized lesion, which has been described by Virchow, Klob, and others.

Now, in the first place, normal lymph contains fibrinogenous but no fibrino-plastic material, and therefore lymphatic fibrine does not coagulate spontaneously. In lymphatic thrombosis, the fluid has undergone some change which produces coagulation of the fibrine. So far as is known, therefore, this disease is always secondary, the primary affection usually being either endometritis, or pelvic cellulitis, or peritonitis, diseases which have no necessary connection with phlegmasia dolens. Dr. Fox himself regards lymphangitis as a rare cause of the thrombosis; and certainly we rarely have evidence of its existence in phlegmasia dolens. So I must say that, while the theory of Dr. Fox is supported by ingenious and plausible reasoning, no proof of its truth has yet been furnished, either by pathology or morbid anatomy.

To conclude this part of my subject, I can only add that, while we know that phlegmasia dolens occurs in the puerperal state and in association with diseases which cause inopexia, and that its most uniform autop-

sical lesion is venous thrombosis, we are still as ignorant of its real pathological nature as we are of that of rheumatism and many other diseases.

Treatment.—I am inclined to believe that the proportion of recoveries in phlegmasia dolens was as great under the treatment of our predecessors, as it is at the present time. Theories did not seem, in this disease, as in many others, to bias their shrewd perceptions as to the therapeutical indications, or their good sense in the application of remedies. The most brilliant genius of all our American obstetricians, the late Professor Meigs, of Philadelphia, was an enthusiastic advocate of the doctrine that phlegmasia dolens is a crural phlebitis, which most writers, at the present day, believe to be an error; yet I suspect that very few, if any, treat the disease more successfully than he did.

The truth is, that the disease tends to a spontaneous recovery, and I believe that the blocking up of the veins by thrombosis is one of the conservative efforts of Nature to promote this end. It is in this way that the system is protected from the dangers of general toxæmia. This effort sometimes fails, by decomposition of the clots, and phlebitis and purulent infection may result, or a fragment of the clot may become detached and transported to the right side of the heart, and thus cause death; but, as a general rule, the effort is successful.

Holding such opinions, I am compelled to say that the treatment will be judicious and successful, just in proportion as it is free from all bias, from theoretical speculations as to the pathological nature of the affection, and just in proportion as it is based on a sound and just appreciation of the special indications of the case. I cannot agree with the most eminent and the

most recent writer on the treatment of this disease, that "depuration of the blood holds the first rank among the general indications" for the treatment of phlegmasia dolens. On the contrary, any treatment which perturbates the system, or disturbs the normal functions, or depresses the vital powers, I must regard as objectionable. If there be a positive indication for a cathartic, an emetic, a diuretic, or any other eliminative agent, give it, of course, but do not make use of any such medicines merely on the theoretical ground that the blood must be depurated.

General Indications.—Now let us see what the indications are: If you study the constitutional symptoms which usher in the disease, but ordinarily subside in a few days—the rapid pulse, the slight febrile movement, the depressed expression of the countenance, the general *malaise*, and the local pains—I think that you will agree with me that they are all referable to nervous irritation and depression. So I should say of the general indications:

First: Allay all irritation of the nervous system. In doing this, you aid in restoring the normal functions, and in rallying the depressed vital powers. The great agent for this purpose is opium or some of its preparations. Give it in such doses and at such intervals as may be found necessary to accomplish the purpose of allaying the irritation, relieving pain, and inducing sleep. In the beginning of this disease, I have seen the pulse fall from 140 to 100, within a few hours after a full opiate had been taken, and, in private patients, who are not exposed to the endemic or epidemic toxic influences of hospitals, I have rarely seen any return of the vascular excitement during the whole course of the disease.

My friend Dr. G. C. P. Clark, of Oswego, has written an essay, in which he seeks to demonstrate that opium is a grand specific for phlegmasia dolens, and, although he writes with the extravagant zeal of an enthusiast, his essay contains many truths which are too generally overlooked.

If special indications exist, you may give a cathartic, apply cups over the kidneys, or resort to any other measures which may be necessary before giving the opiate. But, in private patients, I have rarely seen such indications, except where the disease had developed so late in the puerperal period that medical supervision had ceased.

The fact is often forgotten, that our *rôle* as physicians is more frequently to treat the results of disease than the disease itself. Now, this disease occurs in a system nourished by blood deficient in hematosine, and is, therefore, asthenic in its character; so you will be prepared to hear me say that the second indication is, to give the most nutritious food that can be easily assimilated, stimulants, just sufficient to make digestion easy and keep up nerve-power, and nerve and blood-tonics. You are sufficiently advanced to require no elementary instruction in the details of this indication. I shall only say, in regard to medicinal agents, that, for various reasons which I have not now the time to discuss, I regard the tincture of the chloride of iron as the best preparation to administer as a tonic, and that quinine is especially useful, not only as a nerve-tonic, but also as an anti-pyogenic agent. I shall take another opportunity to refer more distinctly to this property of quinine.

Local Treatment.—As I have before remarked, after the first two or three days, both the symptoms and the

effects of the disease are principally local. At first, it is needless to urge upon the patient the necessity of keeping perfectly quiet, because she cannot help doing so.

The limb should be elevated at an angle above the trunk, and this should be effected by raising the lower part of the mattress, as any thing placed under the leg for this purpose must have some tendency to arrest capillary circulation, and is certain to cause pain and discomfort. The object in keeping the limb raised is not so much to favor the gravitation of the fluids back toward the trunk, as to retard gravitation of the blood toward the limb.

While the swelling is tense and elastic, there is hyperæsthesia of the surface, in addition to the severe pain in deep-seated nerves. This will be greatly allayed by gently rubbing the surface with a piece of soft flannel, well saturated with a stimulating emollient and anodyne liniment, like the following:

℞. Liniment. saponis co.,	℥ vj.
Tinc. opii,	℥ jss.
Tinc. aconit. rad.,	℥ ss.
Ext. belladon.,	℥ ss.

M. Ft. liniment.

Direct the nurse to rub so gently as not to cause pain, to continue rubbing for fifteen or twenty minutes, and always to rub up toward the trunk, and make her comprehend the reason for this direction. I generally order that these medicated frictions should be used every six hours, and that, immediately after the rubbing, the leg should be enveloped thickly with cotton-batting and then covered with oil-silk. I am always careful to show the nurse how to wrap the limb with the oil-silk, so that it can be opened again for the purpose of re-

newing the friction, without giving the patient the pain of turning or moving the limb. These frictions and most effective fomentations not only relieve the tension of the connective tissues and give your patients an immense deal of comfort, but they probably have also considerable influence in promoting resolution, for my experience coincides with that of Professor Meigs, in that I never have this stage of acute tension continue more than forty-eight hours.

When this stage has passed, and the leg begins to pit easily on pressure, the hyperæsthesia is gone, although there may still remain deep-seated pains, if the leg be moved, or if pressure on certain points be made. Now is the time when you must strenuously insist on absolute rest of the limb. I am in the habit of saying to my patients that, if they put their foot to the floor, every minute that it is down prolongs the duration of the disease a day, and I am not certain that this expression exaggerates the danger. Not one patient in fifty has the sense to appreciate such a thing unless it be forcibly presented.

After the period of acute tension, the frictions and fomentations should no longer be used. You should now carefully examine the leg to see whether there be any tendency to localized phlegmon. If you find any point where this seems to be threatened, your treatment must at once be directed to this. I think that, in two instances, I have seen phlegmon aborted by the application of a few leeches, but this is the only condition in which I should ever recommend leeches in the treatment of phlegmasia dolens. I have also seen good result from painting the seat of the threatened phlegmon with iodine. So soon as you discover that there is a circumscribed collection of pus, you should

evacuate it at once, to prevent infiltration into the adjacent tissues. But, if there be no tendency to phlegmon, your treatment must now be directed to the condition of the vessels of the limb. They have been greatly distended; and their muscular coats have lost their elasticity and contractility. So soon, therefore, as the pressure of the finger leaves pitting in the tissues, the indication is to promote absorption of the effused fluids, to overcome the stasis of these fluids, and to restore the tonicity of the vessels. This is best accomplished by applying a roller, commencing at the toes and carrying it up the whole length of the limb. At first, I generally use a flannel bandage, as its elasticity permits an adaptation and yielding to the distended sensitive tissues, but, after a few days, the linen roller is borne without pain, and is more effective.

Hervieux objects to the use of the bandage, because, he asserts, it has the grave inconvenience of exasperating the pain, so that, in a very little time, it becomes intolerable. I have never found this to be the case.

You should first apply the bandage yourself, and continue to do so until the nurse has thoroughly learned how to put on the roller, and some, you can never teach. At first, the bandage should be readjusted twice in the twenty-four hours, but, as the swelling subsides, once a day will be all that is necessary.

Each time the roller is readjusted, the leg should be thoroughly washed with an alcoholic lotion, gently rubbing the surface upward, with a soft piece of flannel.

Some have objected to this friction, from fear of detaching and carrying into the circulation some fragment of a clot in the vein. The suggestion strikes one forcibly, coming, as it does, from some eminent authorities; but, as this friction must have been used in thou-

sands of cases, and as no case of embolism is yet reported as thus originating, I am disposed to continue the use of means which are so palpably advantageous, rather than to give them up, from apprehension of an hypothetical danger.

The use of the roller should be kept up so long as there is any tendency to œdema of the foot and leg, after the patient begins to walk.

The patient may be permitted to walk so soon as all evidence of the local disease has disappeared, but not before. The effort at first generally causes pain, but this gradually disappears as the patient becomes accustomed to use the limb.

The treatment of the secondary phlebitis and pyæmia will be more appropriately discussed in another lecture.

LECTURE XIII.

PUERPERAL THROMBOSIS AND EMBOLISM.

Case—Meaning of the terms thrombosis and embolism—Dr. Robert Barnes's paper and tables—Arterial thrombosis—The great pathological discovery by Virchow—Causes of arterial thrombosis—Symptoms of arterial thrombosis: (*a*) absence of arterial pulsation below the thrombus; (*b*) sometimes increased force of pulsation above the thrombus; (*c*) pain below the seat of the thrombus; (*d*) coldness of the limb; (*e*) paralysis—Difference between this and nervous and cerebral paralysis—Prognosis—Case of probable arterial thrombosis—Thrombosis of the pulmonary artery—Causes: (*a*) more frequently (?) due to an embolus; (*b*) spontaneous; (*c*) secondary to a lesion of the parenchyma of the lungs; (*d*) arteritis—Diagnosis between spontaneous thrombosis and embolism—Theory of Dr. Playfair, that the date after delivery may determine the question whether the thrombosis be spontaneous or be due to embolism—Symptoms of thrombosis or embolism of the pulmonary artery—Terminations — Probable case of, and recovery—How embolism of the pulmonary artery causes asphyxia—Embolism of the minute branches, frequently a cause of puerperal pneumonia—Treatment—Cerebral embolism — Cases—Diagnosis and symptoms.

"Case XVII.[1]—Margaret Regenberger; born in Germany; age unknown. Was brought into the hospital by the police, and found to be in labor. She speaks English very imperfectly, and no satisfactory previous history could be obtained. The membranes were ruptured, and the head, R. O. A. position, was in the cavity, but not pressing on the perinæum. Pulse 120. There were but slight manifestations of labor-pains. An ounce of whiskey was given to her, and she also took, with apparent relish, nearly a pint of beef-soup. After this, she slept for about four hours, with occasionally some appearance of labor-pains. Her pulse now seemed to be growing more feeble, and a second examination was made, when it was found that

[1] Reported by Walter Judson, M. D., house-physician to Bellevue Hospital.

no change in the position of the head had taken place. The catheter was passed, and twenty-six ounces of very offensive urine were drawn off. Tested by heat and nitric acid, no albumen was precipitated. Specific gravity 1028. Immediately after the bladder was emptied, strong pains came on, which were almost continuous, and in twenty minutes a still-born child was expelled. Weight eight pounds and four ounces. All efforts to establish respiration in the child, which were kept up fully an hour, proved fruitless. The placenta followed in ten minutes after the expulsion of the child, and the uterus contracted readily and firmly. The whole amount of blood lost at the time of labor could not have exceeded two ounces. One hour after labor, the patient was found sleeping. The uterus was well contracted and firm, and the napkin, but moderately stained with blood. Pulse 104, and much stronger; temperature 99°.

"*December 8th.*—Was called to see the patient at 5 A. M., eleven hours after the labor, on account of very violent hemorrhage. The bed was literally flooded. The uterus was very large and soft, and pressure expelled a large mass of clots. Pulse very rapid and feeble, respiration hurried and catching. By application of lumps of ice in the vagina and pressure on the uterus, the hemorrhage was at once arrested and the uterus contracted down. Two drachms of ergot in a half-ounce of whiskey were at once administered, and the patient was carefully watched for hours, to see that the uterus remained firmly contracted. At 1½ P. M., she was seen for the first time by Dr. Barker. The pulse was now 120, respiration 32, temperature 99°. The manner of the patient was peculiarly nervous and excited. A full opiate was ordered, and the frequent administration of whiskey and beef-soup in small quantities. But, before any thing could be given or Dr. Barker had even left the ward, she was seized with most violent convulsions, and she had three, with only short intervals of a minute or two between each. Dr. Barker now ordered an hypodermic injection of twelve drops of the solution of morphia (sulphate of morphia grs. xvj, water ℥ j). She had no recurrence of the convulsions after the hypodermic injection. The patient slept most of the time for the twenty-four hours following, but was easily roused to take beef-soup and whiskey.

"*December 9th.*—Pulse 120; respiration 18; temperature 102°.

"*December 10th.*—Pulse 112; respiration 28; temperature 101°.

"*December 11th.*—Pulse 108; respiration 24; temperature 100°.

"*December 12th.*—Pulse 100; respiration 24; temperature 100°.

"*December 13th.*—Pulse 88; respiration 24; temperature 100°.

"*December* 14*th*.—Pulse 96; respiration 24; temperature 99.5°.

"*December* 15*th*.—Pulse 84; respiration 24; temperature 99°.

"*December* 16*th*.—Pulse 84; respiration 24; temperature 99°.

"During the above periods the patient appeared to be rapidly convalescing. The bowels moved naturally. The urine was normal in appearance and quantity, and was several times examined for albumen and casts, with negative results. No secretion of milk could ever be detected in the breasts.

"*December* 22*d*.—Patient in the convalescent ward. She complains of severe pain in the abdomen, which is very tympanitic and sensitive to pressure, and also of pain in the left thigh. The attack appears to have come on very suddenly, after some disagreement with another German patient in the ward. As she had always exhibited a peculiar temper since her admission to the hospital, the attack was supposed to be hysterical, associated, perhaps, with intestinal irritation, as, on vaginal examination, the rectum was felt to be filled with hardened fæces. Turpentine-stupes were laid upon the abdomen, and the following pills were ordered:

℞.	Hydrarg. chlorid. mit.,	gr. v.
	Pulv. aloes soc.,	gr. iij.
	Ext. hyoscyami,	gr. ij.
	Ipecac.,	gr. j.

M. ft. pill. No. 3, to be taken at once. Evening: The cathartic had operated freely and the tympanites and abdominal pain had nearly gone, but she still complains of severe pain in the left thigh. Hypodermic injection in the thigh of eight drops of the solution of morphia.

"*December* 23*d*.—Patient slept well. She complains of no pain in the abdomen, but is unwilling to have the hand placed upon it. Says that she has no pain in the thigh, but she keeps the knee bent, and says that she cannot move it. On examination, there is no tenderness on pressure anywhere in one leg more than in the other, nor can any swelling be detected by the eye; but, on measuring with a piece of tape three inches above the knee, the left leg is found to be a full half-inch larger than the other. Measurements below the knee are precisely the same at all points in both legs. Urine examined, and no albumen found. Pulse 108. Her manner is nervous and hysterical, and the following prescription was ordered:

℞.	Tinc. hyoscyami,	
	Tinc. valerian. ammon.,	āā ℥ j.

M. S. A teaspoonful in syrup and water every third hour.

"*December 24th.*—Patient sitting up by the side of her bed and says she is well. Asks to go out of the hospital to-morrow 'because it is Christmas.' But, as in walking she is evidently lame, although she denies that she has any pain, both legs were again carefully examined, with precisely the same result as yesterday. She was persuaded to remain in the hospital until her month was up.

"*December 30th.*—Since last date, patient has been apparently doing well in every respect, until to-day. Lameness had entirely disappeared. I was hastily summoned to the ward, and found her lying upon the floor, and breathing with great difficulty. Pulse could be scarcely felt at the wrist. Impulse of the heart very weak. Countenance very anxious, with the appearance of immediate dissolution. She was lifted upon her bed, and whiskey, and, soon as it could be procured, carbonate of ammonia were given, and an improvement was soon manifest. But her pulse remained quick and feeble and her breathing, hurried, although she complained of no pain anywhere.

"*December 31st.*—Patient was again seen and carefully examined by Dr. Barker. Pulse 124; respiration 32; temperature 97°. Auscultation furnished only negative signs, except that the heart-impulse was feeble, with a slight tendency to intermission. It was ascertained that she had passed no water since her attack yesterday afternoon, nineteen hours. With some difficulty, she was persuaded to permit the catheter to be passed, and six ounces of thick, muddy urine were drawn off, and, on applying heat and nitric acid, nearly one-half in the tube solidified. Dr. Barker ordered eight dry cups to be applied over each kidney, and the following prescription:

℞. Potas. citrat., ℥ j.
Aq. puræ, ♏ vij.
Syr. simp., ℥ j.
Tinc. digitalis, ℥ jss.
M. S. A tablespoonful every third hour.

"Suspecting cardiac thrombosis, Dr. Barker strictly enjoined that she should not get out of bed, and sent for one of the staff, who speaks German, to make her fully understand this order.

"*January 1st.*—Patient obstinately refused to permit the application of the cups, and exhibited so much excitement in regard to it, that it was thought best not to insist. Pulse 120; respiration 32; temperature 97°. Has passed, in a bed-pan, during the last twenty-four hours, fourteen ounces of highly-albuminous urine. She very

strongly objects to the use of the bed-pan. The same treatment continued.

"*January 2d.*—Pulse 112; respiration 30; temperature 99.5°. Passed twenty-four ounces of urine. Patient very unwilling to stay in bed. She has always been very difficult to control.

"*January 3d.*—Pulse 112; respiration 30; temperature 99° Passed thirty ounces of water; proportion of albumen diminished more than one-half. She insists that she is well, and wishes to leave the hospital. During the succeeding night, the patients in the ward were awakened by a noise, and this woman was found lying by the door of the water-closet. I was immediately summoned, but she died almost immediately after I entered the ward.

"Autopsy, fourteen hours after death. Lungs, apparently emphysematous anteriorly and congested posteriorly. Heart, right auricle and ventricle filled with dark, non-adherent coagula. Pulmonary arteries contained fibrinous coagula slightly adherent to the coats of the vessels. These coagula did not extend to the smaller branches. Liver normal. Spleen, seemed smaller and somewhat paler than natural. Both kidneys were highly congested, the left being more so and decidedly larger than the right. The vena cava contained a fibrinous clot which obstructed both renal veins, but was easily detached from the coats of the vessels, which seemed perfectly healthy. In the left femoral vein, there was also a pale, firm coagulum, more strongly adherent than that in the vena cava. No coagula could be found in the iliac veins. The uterus was somewhat large, but showed no evidence of disease, either in its veins or its lining membrane. The other pelvic organs and the peritonæum healthy. No pathological lesions were found in the brain or its meninges. Spinal cord not examined."

Gentlemen: The circulation of the blood is so universally known to every one of common intelligence, and the knowledge of this is acquired so early in life, that it seems to us an ordinary, elementary fact; and it is only when we consider at how late a period in the history of the world this fact was first made known, that we can appreciate the immense discovery of the immortal Harvey.

I suppose that coagula and fibrinous clots have been

observed in the heart and blood-vessels, at post-mortem examinations, thousands of times since this discovery, without any special significance being attached to the observation, until within a very recent period. It is true, as Dr. B. W. Richardson has shown in his paper "On the Cause of the Coagulation of the Blood," that many of our eminent predecessors, as Vesalius, Morgagni, Gould, Burserius, Brown, Cullen, Huxham, and others, had observed these coagula, and theorized as to the cause of their production. Dr. Benjamin Ball, of Paris, in his very able thesis "On Pulmonary Embolism," published in Paris, 1862, has recalled the fact which had been generally forgotten, that Van Swieten, who wrote more than one hundred and twenty-five years ago, had frequently referred to this lesion, and comprehended it, and that he regarded the prognosis as very grave, when coagulation took place in the veins, and the clots were carried by the circulation into the pulmonary arteries. He also demonstrated, by experiments on dogs, that this coagulation may be produced by injecting acids into the veins, and the phenomena which he describes as resulting from these experiments are precisely the same as those we now understand to result from thrombosis of the right cavities of the heart, or embolism of the pulmonary arteries.

Still, these facts which had been known in science, were practically buried in the past. Our distinguished American obstetrician, the late Professor Meigs, through the unfortunate bias of a preconceived theory, just escaped the honor, which is now, and will hereafter be given, to the eminent Virchow, of Berlin, of a great pathological discovery.

Dr. Meigs was essentially a solidist; and, while he

was one of the earliest to report cases where the circulation was arrested by coagula in the right cavities of the heart and the pulmonary arteries, and, at the same time, while he fully appreciated the pathological significance of the facts, he believed that the primary lesion which produced this result was in the lining membrane of the veins, or, to use his favorite term, in the endangium.

His theory was, that this membrane contained or transmitted that nerve-power by induction which is essential to the formation and preservation of the blood in a living state—in short, that the endangium was the blood-making tissue. But, at the time he wrote, physiological science had advanced some steps beyond his knowledge, and, consequently, the doctrines of the day were beginning to change—clinical facts received new interpretations, and the earnest, enthusiastic, and sometimes eloquent writing of Dr. Meigs on this subject made little impression on the medical mind.

It rarely if ever occurs that one mind can grasp the full development of new truths in science; and we shall see, in discussing this subject, that even the great Virchow generalized beyond the point at which he could be supported by more numerous and complete observations.

Let me stop here to define the meaning of terms, which I shall have frequent occasion to use, because I observe that some writers use these terms loosely, and thus confuse the ideas which they are seeking to express. I have noticed that one writer proposes to restrict the term thrombosis to obstruction of the veins by coagula, and embolism to obstruction of the arteries by coagula or any foreign substance. It seems to me absurd to seek to attain precision of language by this purely arbitrary use of terms.

You already understand by thrombosis, the arrest of circulation by coagulation in any of the vessels, whether it be the arteries, veins, or lymphatics, and so we have arterial thrombosis, venous thrombosis, and lymphatic thrombosis. Now, if you bear in mind the etymological derivation of embolism, you will avoid all confusion in the use of these terms.

The Greek word εμβολος signifies something inserted, as a wedge—something blocking up. If a fragment of clot in a vein become detached, and be carried by the circulation up to the heart, and thence to a branch of the pulmonary artery which is too small to permit it to pass on, this stops the current of blood, and constitutes embolism of that artery. If an excrescence be detached from one of the aortic valves, and be carried into the arterial circulation, when it reaches an artery of too small a calibre to permit it to pass on, there is embolism at the point where the circulation is arrested. It may be small enough to be carried on to a capillary vessel, and then we have capillary embolism. Thus you see that an embolism implies that the blocking agent, whether it be a detached fragment of coagulum, a valvular excrescence, a pus-globule, or any foreign substance, has been transported from some other point in the circulation. Furthermore, it is obvious that the emboli, or blocking agents, if in the veins, are always carried toward the heart; but, if in the arteries (excepting, of course, the pulmonary arteries), they are always carried from the heart.

You see that this subject opens up a wide domain in general pathology, but my remarks must be restricted to its relations to the puerperal state; and you will perhaps best remember and comprehend the points to which I especially wish to call your attention, if I

speak of them in the systematic order of pathological anatomy.

Arterial Thrombosis.—To the late Sir James Simpson, all must give the credit of writing, in 1854, the first essay on this, as a lesion of the puerperal state; and this has always struck me as one of the most able and original of all his numerous contributions to medical science. Since this essay was published, many writers have reported cases confirming the observations of Professor Simpson, and, in the fourth volume of the Transactions of the London Obstetrical Society, you will find a paper by Dr. Robert Barnes, probably more valuable than any which has yet appeared, for its analysis of the antecedent conditions, the symptoms, and the post-mortem results of this lesion.

Thrombosis may occur, as a lesion of the puerperal period, in any part of the arterial system. Cases have been reported, where one or more arteries of the lower extremities have been found blocked up by coagula. In other cases, the thrombus was in the aortic or iliac or other arteries of the trunk, and in others, again, the lesion was found in one or more arteries of the upper extremities or in the brain.

The number of cases reported of this lesion in the trunk and extremities is as yet very small. As a puerperal accident, I have seen but one in which I suspected its existence, and, in this instance, the subsequent entire recovery of the patient rendered it impossible for me to be certain of the correctness of my diagnosis. I can therefore only give you such a summary of its causes, symptoms, and prognosis, as I have gathered from the writings of others on this subject.

Causes.—There is no doubt that, in a large majority

of cases, arterial thrombosis is the result of an embolus, the original seat of which was the heart.

(1.) The embolus is, in some cases, a detached portion of a valvular excrescence which has been washed away and carried into the arterial circulation, for the nucleus of the embolus, around which concentric layers of fibrine have been deposited, has been shown by the microscope to be exactly like the vegetations which were attached to the aortic or mitral valves. In several instances where this condition has been found, it was known that the patients had previously suffered from rheumatism and endocarditis.

(2.) In other cases, there seem to be good reasons for believing that the embolus was a clot which had originally formed in the left cavity of the heart and was carried into the circulation. The argument in favor of this view is based not only on the negative evidence, that sometimes nothing has been found in the thrombus except a fibrinous nucleus, and that the valves of the heart were free from disease, but also on the positive evidence, that fibrinous polypi have been found in the left cavities, and that the symptoms of cardiac distress have preceded the signs of local obstruction. I have before referred to inopexia, as a condition peculiarly liable to exist in the puerperal period, and I concur also in the opinion of Dr. Barnes and of Hervieux, that this may be rapidly developed by some puerperal toxæmia.

It is known that arterial thrombosis is sometimes the result of that exceedingly rare disease, arteritis, which itself is never a primary lesion, but is always secondary to pathological changes in contiguous tissues or to puerperal toxæmia.

Symptoms.—The symptoms of this lesion, which

were observed by Simpson and others who have reported cases, and which are enumerated in the table of cases published by Dr. Barnes, are chiefly the following:

(1.) Absence of pulsation in the artery below the point of the thrombus. Most of us are in the habit of examining only the radial pulse, but, when severe neuralgic pains occur in the track of an artery of either an upper or lower limb, and there is an absence of all signs of local inflammation, it is incumbent upon us to examine the pulsation of the artery at all accessible points. In some cases, the force of the pulsations above the point of the thrombus is greatly increased, but this by no means appears to be a uniform symptom, as its absence has been sometimes specially noted.

(2.) Pain in points below the seat of the thrombus is mentioned in nearly every case. It is described as "very severe," "excruciating," "neuralgic," or "rheumatic." It seems generally to subside, after a period of more or less duration, but it persists in some cases, and is the most prominent and striking of all the symptoms.

(3.) Coldness of the limb, as compared with the one not affected, is another very marked symptom. This is not always noticed by the patient, who sometimes even complains of heat in the part affected, but the difference in temperature is very perceptible to the hand of the physician.

(4.) If the arterial obstruction be sudden and complete, there is, for a period, varying in duration in proportion to the importance of the artery affected, complete paralysis of the nerves of motion and sensation, to which there succeeds only diminished mobility and impaired and perverted sensation. M. Hervieux very clearly points out the characteristic differences between

paralysis due to arterial thrombosis, and nervous and cerebral paralysis. There is no special modification of the pulse in nervous and cerebral paralysis, but, when the artery is obliterated, there is no pulsation. The temperature of the part affected is habitually depressed in arterial thrombosis—it remains normal in nervous and cerebral paralysis. The paralysis from arterial thrombosis is frequently followed by gangrene, but this result is not common in other varieties of paralysis.

(5.) Several cases have been published, in which gangrene of the extremity has followed the arrest of the arterial current. Gangrene is a very important symptom of this lesion, if associated with other of the prominent signs, but it must be remembered that gangrene in the puerperal woman is not unfrequently a result of toxæmic causes, as we have repeatedly seen, in this hospital, gangrene of the uterus, of the vulva, of the sacrum, or of the mamma. In some instances of gangrene from arterial thrombosis, the affected limb has been amputated, and the patient has recovered.

Prognosis.—Arterial thrombosis is a lesion of great danger, both to life and limb; but it has been demonstrated that a considerable number of cases have recovered. It is therefore manifestly important that we should be able to appreciate the conditions which should govern our prognosis.

The more complete the obliteration, the more seriously is the organ, which derives its nutrition from the artery implicated, threatened as to its functions and vitality. As a law, subject to certain modifications referable to the condition of the general system, we may say that the greater the size and importance of the artery which is blocked up, the greater the danger involved in the thrombosis; as, for example, thrombosis

of an artery in the foot is less serious than thrombosis of the tibial artery, thrombosis of the latter is less dangerous than that of the femoral artery, and so on.

When the thrombosis involves one of the cerebral arteries, the prognosis must be based upon the evidence furnished by the functions of the brain, which are disturbed by the lesion.

The more essential the organ is to life, the greater the danger from the obliteration of its nutritive artery.

Paralysis, if complete and persistent, and more especially if followed by gangrene, certainly involves the loss of the limb affected, and very generally a fatal result is to be anticipated. If, however, this be wholly a local affection, and not associated with severe constitutional disturbance, there are reasonable grounds for hope.

The prognosis must always be grave, when the signs and symptoms are conclusive, that the thrombosis is the result of a cardiac embolus.

I have seen several cases of this lesion, but, as I before remarked, only one, connected with the puerperal period. As this case is unique in my experience and somewhat curious, I shall give its history in detail:

"Case XVIII.—Mrs. ——, twenty years of age, was confined with her first child on the 28th of April, 1860. Three weeks before, she had rather a severe attack of measles, but, with the exception of a cough, she had quite recovered before her accouchement. With this exception, she had never been confined to her room a day by illness, since her infancy. Her labor and subsequent convalescence were in every respect normal.

"At midnight, May 22d, I was summoned to see her, on account of a most excruciating pain in the foot, more especially in the heel. I think that I never saw the appearance of greater agony, which was the more striking, as she had borne severe labor-pains without an anæsthetic, and without a groan. But now she was constantly

reiterating: 'Give me something to relieve me, or kill me at once.' Her pulse was somewhat excited, but indicated no grave constitutional shock. She was as fearful of having her foot touched as I ever saw one in the most severe paroxysm of gout. But the foot seemed entirely free from swelling and redness. In short, she had no other symptom, except intense local pain, nor was there any symptom preceding the attack. She had taken a drive the previous afternoon for the first time, without feeling in the least fatigued, had eaten a hearty dinner, and retired to bed at ten. The pain in the heel came on suddenly about eleven, and, as I subsequently learned from her husband, immediately after sexual connection, which he had indulged in for the first time after her accouchement.

"I at once injected into the calf of the leg, ten drops of the solution of the muriate of morphia (sixteen grains to the ounce of water). After waiting a half-hour, and finding that the morphia had made no impression, I again injected fifteen drops, and the same quantity again after the lapse of an hour. The last seemed to have some effect. I remained an hour longer, fearing that the large quantity of morphia introduced into the system might produce narcotism; but, as she slept lightly, often wakening to complain of pain, I now left her. At 5 A. M., I was again called, and found her suffering nearly the same as when I first saw her. Fifteen drops of the solution were again injected, and this was repeated in a half-hour, when she fell into a sound sleep.

"At 9 A. M., I again saw her. The pain had returned with mitigated severity, so that I was now able to examine the foot with great care. She declared that it was impossible to flex the ankle or the toes. This foot seemed decidedly colder than the other to my hand, although her sensation was that it was warmer. I could detect no pulsation in the tibial artery, while, in the other leg, the pulsation was very distinct. I could perceive no increase of force in the arterial pulsation at the popliteal space, or in the femoral artery.

"I now accepted with great pleasure the proposal for consultation with one of our most prominent surgeons, and met him at half-past one that afternoon. The pain in the heel and foot had then returned, but with much less intensity than before. My friend, the surgeon, was disposed to regard the phenomena as due to hysteria, and spoke of the wonderful tolerance of morphia as an evidence of this. But, on calling his attention to the difference of temperature between the two feet, and asking him to feel the pul-

sation of the posterior tibial artery, he was greatly surprised to find that he could detect none. When I suggested the probability of arterial thrombosis, he objected that there were no signs of arteritis. He was evidently unaware that this lesion is much more frequently due to embolism.

"The pain gradually disappeared, and, on the following day, she could flex her toes. On the fourth day after the attack, I was able to detect a feeble pulsation in the artery, and, in two weeks, my patient seemed to have entirely recovered."

I will add that this patient had phlegmasia dolens of the same leg after the birth of her third child.

Thrombosis and Embolism of the Pulmonary Arteries and of the Right Cavities of the Heart.—These are lesions which undoubtedly occur much more frequently in puerperal women than arterial thrombosis and embolism. In a former lecture, I have referred to hyperinosis and inopexia, as a condition of the blood in the latter months of gestation and for a certain period after delivery. Venous thrombosis has long been recognized as one of the frequent lesions of the puerperal period, but to Virchow belongs the honor of having established the fact in medical science that a portion of a venous clot may be detached and carried into the circulation, and cause sudden death by its arrest in the pulmonary artery. From autopsical examinations, and from the results of a series of experiments, Virchow arrived at the conclusion that thrombosis of the pulmonary artery was always due to embolism, except in the very rare cases where it resulted from lesion of the parenchyma of the lungs, or from disease of the artery itself.

But more recent observations have demonstrated that clots may form, both in the pulmonary artery, and in the right cavity of the heart, as a primary lesion.

If the conditions of hyperinosis and inopexia be increased by hemorrhage or any other cause which

results in anæmia and asthenia, spontaneous thrombosis may occur in the pulmonary artery or in the right cardiac cavities, in some cases, when there is no thrombosis in the veins, and in other cases, at the same time or even before the clotting in the peripheral veins. These facts were prominently brought out by Dr. W. S. Playfair, of London, in a series of able papers on this subject, published in the *London Lancet*, in 1867. M. Hervieux, in the work to which I have before referred, advocates opinions similar to those of Dr. Playfair, and both give cases illustrating spontaneous thrombosis. Indeed, there can be no doubt at the present day that this is often the cause of the sudden or rapid deaths which occur in the course of various diseases, as rheumatism, typhus fever, phthisis, and various other complaints, as well as those which occur in the puerperal period, which were formerly believed by obstetricians to be due to "idiopathic syncope."

Most men who have had some years' experience in obstetric practice have probably met with one or more cases of sudden death arising from this cause. In 1861, I received an urgent summons to visit a lady in Union Square, but, on my arrival at the house, I found that she had just died. I subsequently learned from my friend, Professor I. E. Taylor, who had attended the case, that, on the fourteenth day after confinement, she was attacked with phlegmasia dolens of the right leg. The disease had subsided in about ten days after the attack, and she was apparently convalescent. She was anxious to move to another room, and, being a person of strong will and difficult to control, Dr. Taylor had felt the importance of absolute quiet and had emphatically insisted that she should remain in the same room. The morning of her death, his visit was delayed an

hour or two later than usual. On arriving at the house, he was hurried to her room and found her gasping for breath, throwing herself from one side of the bed to the other, and she died a few moments after he entered the room.

On the 2d of July, 1866, I attended the wife of a prominent lawyer of this city, in her second confinement. At the time of her first labor, she had convulsions. In the latter weeks of her second pregnancy, she had many symptoms of albuminuria and was placed under the prophylactic treatment for this affection. I was extremely apprehensive of convulsions at the time of labor, but they did not occur, and she was safely delivered by forceps of a very large and healthy boy. Her convalescence for ten days after was in every respect satisfactory, and I left the city. On the sixteenth day after labor, she was attacked with phlegmasia dolens, when she was attended by my friend, Professor C. A. Budd. The attack was apparently not severe, and the disease seemed readily to yield to treatment. She had so far recovered as to be able to go out for a drive, and Dr. Budd had practically ceased his attendance, when, after rising from bed to dress, while pulling on her stocking, she suddenly fell over, the face became purple, and she made violent gasping efforts to breathe. Her mind was perfectly clear, but she died in less than an hour from the time of the attack.

In February, 1870, I several times saw a patient with Dr. T. Matlack Cheeseman. In the seventh month of gestation, she had albuminuria and several convulsions, for which she had been bled and treated by elaterium and citrate of potash. All trace of albumen had disappeared from the urine before her confinement, and the labor terminated without convulsions. About

three weeks after, she had some swelling and pain of the right leg, which she could move only with difficulty, but there was no phlegmasia dolens. One morning, on rising to go to the wash-stand, she was suddenly seized with palpitation, very great difficulty of breathing, and the appearance of asphyxia, to such a degree that she was supposed to be dying. When Dr. Cheeseman and myself saw her, the pulse was very feeble, the impulse of the heart was very weak, the respiration was gasping, the face livid and the surface cold, and we were perfectly agreed in ascribing her symptoms to embolism of the pulmonary artery. She was given ammonia and other stimulants as freely as they could be taken, and the most rigid abstinence from every attempt at muscular effort of any kind was strenuously insisted upon. During the day, she had a second attack of the same kind, but less severe. The correctness of our diagnosis seemed to be confirmed by the evidences of pulmonary infarctions which soon followed, as shown by pains in the lungs, cough, with scanty expectoration of tenacious sputa, slightly tinged with blood, and feeble respiratory murmur, with an occasional bronchial *râle*. A few days after, she had a third attack of asphyxia, and, again, the fourth, in which she died.

Although there was no autopsy in either of these three cases, yet I think that no one can have any doubt as to their real character.

We should say, then, that the causes of thrombosis of the pulmonary artery are:

(*a.*) An embolus from a clot in a peripheral vein.

(*b.*) Spontaneous, arising from the same condition of the blood (hyperinosis and inopexia) as causes thrombosis in the veins.

(*c.*) Such lesion of the parenchyma of the lungs as arrests the current of the blood through the smaller branches of the pulmonary artery.

(*d.*) Arteritis, which is exceedingly rare.

From an analysis of twenty-five cases of sudden death after delivery, Dr. Playfair infers that the diagnosis between spontaneous thrombosis and embolism of the pulmonary artery may probably be determined by the period after delivery when the phenomena of the lesion are first developed. He believes that true embolism does not occur until after the nineteenth day after delivery, and generally not until a much later period than that, because a considerable time is required for the thrombi in the peripheral veins, from which an embolus is derived, to soften and disintegrate sufficiently to admit of a portion being detached and carried to the right side of the heart. But, when death happens shortly after delivery, he believes that the coagulation in the pulmonary arteries corresponds to the formation of the original thrombus in the peripheral veins, which must of necessity occur in cases of true embolism. If subsequent and more extended observations confirm this theory, it strikes me as a pathological fact of great practical importance, although Dr. Playfair himself speaks of it as a question more interesting from a theoretical than a practical point of view.

Symptoms of Thrombosis and Embolism of the Pulmonary Artery.—The most characteristic and prominent of the symptoms, and usually the first to be noticed, is the great difficulty in breathing. This is sometimes frightful, the respirations suddenly increasing to forty or fifty a minute, with convulsive contractions of the muscles of the chest, and inexpressible anguish and anxiety, followed by rapid prostration of the vital

forces. The movements of the heart are at first impetuous and irregular, but speedily become very feeble and rapid. The pulse in a short time becomes very frequent, small, weak, and sometimes imperceptible. The patient prays for air, the face becomes livid, the surface is covered with a cold sweat, and the extremities are cold.

In some, death follows a few moments of agony, while in other cases, after a little time, there is a mitigation of the symptoms, and the fatal result is postponed for a few hours, or it may be for a few days. I have no doubt that a very considerable number of such cases entirely recover. In my own experience, I think that I can recall several such, some of which occurred before I had any knowledge of the real nature of the affection. It would seem as if the obstruction of the artery is gradually removed, either by displacement or fragmentation, and all the symptoms resulting from the occlusion disappear.

I shall briefly detail one case of most intense interest to me, which, in the light of our present knowledge, I should include in this class:

Case XIX.—Mrs. ——, of Mobile, whose mother and two sisters had died from post-partum hemorrhage, came to New York to be attended by me in her first confinement. She had the fixed conviction that her own death was certain to result in the same way, and always spoke of it with perfect calmness, but as an event which was absolutely certain to occur. She was at the New York Hotel, and her labor commenced about eight in the morning, June 6, 1857. It was not more severe than ordinary first labors, and terminated at nine in the evening by the birth of a fine male child. There was not the slightest manifestation of nervousness or hysteria; but she absolutely declined to inhale chloroform, assigning as a reason that while she lived she wished to have her full senses. Of course I had taken every precaution against post-partum hemorrhage, and there was none. At half-past ten,

she was, in every respect, apparently in as good condition as any woman an hour and a half after labor, and her husband and myself left her, to go to the dining-room of the hotel. We returned about an hour afterward, and found that she had slept nearly the whole time of our absence. She was very cheerful, and spoke of her past apprehension as absurd. I examined her very carefully, and, finding that there was no hemorrhage, that the uterus was well contracted, and the pulse normal, I took leave of her for the night. But I had not descended the first flight of stairs, when I was called back by her husband's voice in a tone that thrilled through me, saying that she was dead. In stooping to kiss her good-night, he observed a sudden change in her face, and a fearful gasping for breath. My first thought was of internal hemorrhage, but I was soon satisfied that there was none. Her agony for breath was indescribable, and her whole appearance was so much like one dying from hemorrhage, that I made repeated examinations. The pulse could not be felt at the wrist, and the heart was beating irregularly and tumultuously, but with a feeble impulse. Her countenance seemed to bear the stamp of death, her face and forehead were covered with cold drops of perspiration, and her extremities were cold.

From this time until after six in the morning, I never left her for one moment. She took, during this time, a full half-ounce of McMunn's elixir of opium, a full bottle of brandy, and a wineglassful from a second bottle. Many times, as the liquid was put into her mouth, it gurgled in her throat, and I was obliged to stimulate deglutition by all the reflex means at my command. Twice I applied a lighted taper to the epigastrium for this purpose. This excited a gasping respiration, breathing having apparently ceased, and deglutition immediately followed. At half-past six in the morning, her respiration had greatly improved, her pulse had returned to the wrists, and the extremities had become warm. I need not tell you with what anxiety I watched this case until she had perfectly recovered.

The following autumn, I saw a case almost precisely like this, with the late Dr. Henry G. Cox. The patient, the wife of a Moravian clergyman, had given birth to twins four or five hours before the symptoms of asphyxia had appeared. In this case, I think the quan-

tity of brandy given by Dr. Cox was even greater than the amount taken by my patient. She recovered, but subsequently had phlegmasia dolens, when I again saw her with Dr. Cox. Neither of us at this time suspected any condition of the blood as bearing a common relation to the phenomena of the different attacks.

But you may ask me what reasons I have for regarding these as cases of thrombosis of the pulmonary arteries rather than as cases of "idiopathic syncope."

I answer, because the symptoms were those of asphyxia and not those of syncope. In syncope, consciousness is abolished; in asphyxia, the intelligence is enfeebled by the great depression of the vital powers, but the consciousness may remain until just as death is impending. Perhaps we are apt to associate with the idea of asphyxia, simply the absence of respirable air. But respiration implies an interchange of elements between the blood and air, and asphyxia may be equally due to absence of blood in the lungs.

Thrombosis of the pulmonary arteries may suddenly cause death by complete asphyxia, or life may be prolonged some hours or even days, and gradually terminate by a series of attacks of asphyxia.

If the thrombosis be confined to minute branches of the pulmonary artery, there are no signs of asphyxia, or other symptoms of the lesion at the time of its occurrence, but we then have, as a consecutive result of the obliteration, lesions of the parenchyma of the lungs, limited in extent by the number of branches involved in the thrombosis. There is no doubt that the lobular pneumonia of puerperal women is not unfrequently due to this cause, and that, in some cases, this pneumonia terminates in gangrene.

Treatment.—I have but little to add in regard to the treatment of this affection.

When the symptoms of asphyxia are suddenly developed, do not hastily give up your patient. If you can only bridge her over the danger of the first attack, you have much to encourage you to continue your efforts.

Perhaps the stimulus of hope, inspired by your own quiet, confident, self-assured manner, may be really as effective as the alcoholic drinks and the opiates that you prescribe. I say opiates, because I regard them as quite as essential as wine or brandy. It does not now come within my province to discuss this great therapeutical problem; and so I must be content with merely expressing my belief, that the value of opium in restoring the vital powers, depressed by the shock of asphyxia, is not less than in shocks from other causes.

In all cases, and especially where the symptoms of thrombosis of the pulmonary arteries are consecutive to an attack of phlegmasia dolens, you cannot insist too rigidly on the necessity of absolute rest. The patient should not be allowed to make the slightest physical effort for days, at least until the impulse of the heart has recovered its normal force.

As to the chemical therapeutics of this lesion, I think that we are yet too much in the dark to warrant me in making any suggestions.

The indications for the use of quinine, iron, and agents of this class, are too obvious to require comment.

Cerebral Embolism.—But few cases have been published in which cerebral embolism has occurred in the puerperal woman. Professor Simpson, in the paper to which I have before referred, quotes one case from Dr. Burrows, in which the patient, the wife of an esteemed

obstetrical friend, became suddenly hemiplegic on the right side, but without symptoms of cerebral congestion, about six weeks after delivery. The hemiplegia and impaired powers of speech and memory remained to the time of death. At the autopsy, abundant vegetations were discovered on the aortic and mitral valves, so that they were softened and ulcerated through. The left corpus striatum was reduced to a mere diffluent pulp, and the branch of the left middle cerebral artery passing to this part of the brain was obliterated by a small mass of fibrine, like a grain of wheat, implanted in the vessel at its origin from the middle cerebral artery. The artery beyond the obstruction looked like a pale, thin string, and was impervious.

A case of cerebral embolism occurred in our lying-in wards last year:

"Case XX.—Delia C——, aged twenty-two, single; primipara; was delivered of a living girl, weighing eight pounds, February 11, 1872. I have a full report of the case, furnished by Dr. Edward W. Burnett, house-physician, up to February 24th, when, unfortunately, owing to illness, he was unable to continue his record. On the 13th, two days after delivery, she had a chill, followed by fever, thirst, and severe pain in the region of the uterus, and for some days the catheter was required to empty the bladder. The temperature was high, 104.8°, and the pulse, 132. There was but little change in her symptoms for the following seven days, when she was apparently convalescent. But, on the 22d—that is, on the eleventh day after delivery—the temperature rose to 105°, and the pulse to 124. On the 23d, she was found to have aphasia, although she apparently understood every thing said to her. It is also said that fluid ran out of the left corner of her mouth. She died on the 27th, and Professor Janeway has kindly given me the following notes of the autopsy, which he made on the 28th:

"*Exterior.*—Poorly nourished; abdomen tympanitic.

"*Brain.*—Left middle cerebral artery contains a firm, white clot, at its first bifurcation. This clot is prolonged into both vessels at the bifurcation for some distance, and backward, as a reddish throm-

bus of a later date. The artery going toward the third frontal convolution is plugged by a thrombus of more recent date than the first named. At the termination of the fissure of Silvius, the pia mater has a slight lymph-exudation in its meshes. The anterior half of the left corpus striatum, especially its lower portion, is little changed in color, but is considerably softer than natural. The tissue is infiltrated with serum, which oozes out in sections, giving a worm-eaten appearance, the line of demarcation between softened and healthy tissue being well marked. Outer portion of island of Reil in same condition. The third frontal convolution and remainder of brain normal.

"*Heart.*—Size normal; aortic valves normal; mitral valves thickened to a moderate degree, somewhat shortened, and present vegetations on their auricular surface, a couple of which are one-eighth of an inch in length.

"*Lungs.*—Right; old firm adhesion. Left; slight exudation on diaphragmatic surface of pleura.

"*Abdomen.*—Slight exudation upon liver and intestines, and considerable between rectum and uterus.

"*Liver.*—Large, but appears normal.

"*Spleen.*—Three times the usual size, wedge-shaped infarction at upper part. Artery going to this, obstructed by whitish thrombus.

"*Kidneys.*—Present a few small, yellow infarctions, the size of a pin's head.

"*Stomach and Intestines.*—Nothing special.

"*Uterus.*—Inner surface, at seat of placental attachment, presents a number of protruding clots of creamy color. Upon the anterior surface, a little below the anterior border, there protrudes into the cavity, a rounded swelling. On cutting through this, there is found a portion of uterine wall, one inch in length and one and one-quarter inch in thickness, which looks like an infarction of the uterine substance, partly surrounded by a suppurative process, which has nearly separated it. The right ovary shows the corpus luteum more œdematous than usual, surrounded by a thin, white wall, looking like fibrous tissue. No other abnormal appearances are discoverable."

At my request, Dr. Henry F. Walker, of this city, has furnished me with the following report of a very interesting and rare case, which occurred in his practice:

"CASE XXI.—Mrs. J——, aged thirty-two; primipara; of blonde complexion and plump figure; had been remarkably well during her pregnancy. She was naturally of a nervous temperament, and had often been hysterical. During the seventh and eighth months of gestation, she had suffered slightly from dyspepsia. Her urine was examined two or three times, at intervals of a week, and found free from albumen, but, during the last six weeks preceding labor, it had not been tested. The patient, however, had felt unusually well, walking two miles the day before her confinement.

"*May* 2, 1870.—I was first called to see her at 5 A. M. The os uteri was dilating, being the size of a nickel cent, pains occurring every five minutes, vertex presenting in the first position. The membranes had ruptured early, and with each pain there was a discharge of liquor amnii. She complained of slight headache, which passed off after taking food. I saw the patient every hour till half-past one P. M. At that time she was comfortable. The os uteri was as large as a silver dollar, its edges thick, but dilatable. The pains were of moderate intensity, and the *morale* of the patient was good.

"At 3 P. M., I was summoned in great haste. I found Mrs. J—— completely hemiplegic. The left side was paralyzed in both motion and sensation. Her sister, a very intelligent lady, who had not left her for a moment, stated that the patient had acted queerly, had cried out with an intense pain in the head, putting her hand to the right temple, and had torn her hair, but that she became suddenly quiet, without loss of consciousness, or convulsive movement. Then the sister noticed that Mrs. J—— mumbled in her speech, and, when offered a drink, the water ran from her mouth.

"The patient was quiet, complained of slight pain in the right side of the head, seeming entirely conscious of what was said and done, but was unable to articulate intelligibly, although she would speak until she completed the sentence attempted.

"I gave her four drops of Magendie's solution of morphia hypodermically, drew and tested the urine, which was highly albuminous, and sent for Dr. Thomas, who in turn sent for Dr. Peaslee. Immediate delivery was decided upon, and Dr. Thomas, after the patient was chloroformed, further dilated the uterus manually, applied forceps, and delivered a large, living female child, which throve from its birth. The uterus contracted slowly but firmly. Patient slept quietly at night.

May 3*d*.—Headache quieted by morphine given hypodermically, gtts. v. of Magendie's solution every four hours. Pulse 100.

"*May 4th.*—Pulse 120. Skin hot and dry. These symptoms were relieved by a single hypodermic injection. Treatment was commenced with special reference to the renal trouble, a wine-glass of a solution of potass. bitart. being given every three hours, which apparently affected the kidneys beneficially, the urine becoming much less albuminous. Her diet was milk and beef-tea. After the third day, there was no rise of temperature or acceleration of pulse.

"*May 7th.*—Headache still continued, but checked by the hypodermic use of morphia. The paralysis of the face less, sensation returned slightly to the leg, but no power of motion.

"*May 11th.*—Patient was to-day told that she was paralyzed. She had complained of numbness in the extremities of the left side, but was only puzzled at her condition. She said that she supposed her hand obeyed her will, and it was only when she touched one with the other that the left 'felt like a clump.' When she arranged the bedclothes at her throat with her right hand, she supposed that she coördinated with the other. Morphia omitted. Five grains of potass. bromidi to be given if restless. Voluntary micturition was impossible from the time of delivery to May 17th, when vesical power became perfect. From this time improvement was constant.

"*June 3d.*—She walked about the room pushing a chair.

At the present date, May, 1873, she is entirely well in all matters of nutrition and perception, but she still has diminished control over the paralyzed side. The hand is more manageable than the foot and leg, and, for a slight contraction at the ankle, which still persists, the patient is employing treatment by passive movements with benefit.

"In this case, the diagnosis would be between cerebral hemorrhage and embolism. The patient was under most careful observation, and nothing like convulsions could have occurred unnoticed. If a convulsion had occurred, leaving the patient permanently hemiplegic, cerebral hemorrhage would alone explain the paralysis, but, as the result of either convulsion or primary apoplexy, we should have had either mental hebetude or entire loss of consciousness, neither of which was manifested. Embolism only explains the immediate and subsequent symptoms."

I regard this case as one of remarkable interest, and in some respects it is unique in obstetric literature. I think there can be no doubt as to the correctness of the diagnosis of Dr. Walker, and that the right middle

cerebral artery was the seat of the embolism. The character of the attack, the absence of coma, the headache, and the age of the patient, are all in accord with this theory. The slow recovery also indicates the collateral œdema or softening which is associated with embolism.

It is impossible to diagnosticate embolism of the right middle cerebral artery with the same certainty as the same lesion on the opposite side, as there is not the symptom of aphasia to aid us in the diagnosis. Most authors agree in the assertion that embolism of the left middle cerebral artery occurs much more frequently than of the right, and this is explained by the anatomical fact that the left carotid artery takes its origin from the arch of the aorta in a direct line with the current of the blood, while the right carotid springs from the arteria innominata, and thus forms an angle with the aorta. Thus, a detached vegetation from the aortic or mitral valve would be easily carried along with the current in the left carotid.

A case has recently occurred in this hospital, in the service of my colleague, Professor William T. Lusk. So small a number of cases of cerebral embolism in puerperal women have as yet been published, that I shall make no apology for giving, in its full detail, the following report, by L. J. Brooks, M. D., house-obstetrician:

"Case XXII.—Mary ——, admitted September 24, 1873; aged nineteen; seamstress. Born in Providence, R. I. Family history good. Parents still living. She states that she has always had excellent health, and has 'never been sick a day.' She is a temperate woman, and, save the present attack, has never suffered from rheumatism, or any chronic affection. Menses began at the age of fifteen, and were always regular. Patient gives no evidence of any uterine trouble—and never had coition, except on the occasion

which resulted in the present pregnancy. There is no history of any cardiac trouble.

"She menstruated last in December, 1872, the beginning of her present pregnancy. During gestation, nothing unusual occurred. Her labor began September 2, 1873, at 5 P. M., and the attendance of a midwife was secured. She delivered the patient of a boy, at the expiration of two hours. The delivery was followed by post-partum hemorrhage, by which she lost a large amount of blood. This occurrence prostrated her very much, but she nevertheless got up on the third day after confinement. For the three weeks following, she daily lost some blood, which gradually weakened her more and more, so that, on admission (September 24th), she was forced to take to the bed. The child is healthy and vigorous, and probably aided in exhausting the strength of the patient.

"On admission to Bellevue, she was pale and anæmic. The skin white—no redness in the cheeks or lips—the eyes bluish-white, pulse soft but regular, temperature a little elevated. Complains of great weakness, loss of appetite, and general prostration. The knees and ankles are a little swollen and tender, and the inflammation in them appears to be rheumatic in character. This trouble began yesterday, and is the first of the kind she has ever had.

"She is ordered nourishing diet—tonics—porter—perfect quiet—and the affected joints are enveloped in cotton, saturated with lotio plumbi et opii, and covered with oil-silk.

"*October 1st.*—Patient appears to be growing weaker. Has lost no blood since admission. Spirits languid, and expression dull. Skin anæmic, hot, and dry. Tongue a little coated, and papillæ prominent; some thirst; anorexia; bowels confined. No abdominal pain or tenderness. Temperature a little elevated. Pulse somewhat rapid and feeble.

"*Physical Examination.*—Right lung, behind—slight dullness, increased fremitus, diminished breathing, increased voice-sounds, and abundant loud, sibilant, and sonorous *râles*. Over left lung, some sibilant and sonorous *râles*.

"Heart—a loud mitral regurgitant murmur, transmitted to the left, over the posterior surface of the left chest and along the spine.

"She was ordered quiniæ sulphat. gr. v., three times a day, and vini ferri et cibi cum cinchona, ℥ ss, thrice daily, and to continue porter and extra diet.

"*October 5th.*—Her condition is a little improved. Has some

tenderness in both iliac fossæ. Same physical signs in the chest remain. Treatment continued.

"*October 8th.*—Patient has been getting out of bed for several days to go to the water-closet, although positive orders are given for her not to do so. While disobeying this order last night, she was suddenly taken with what the nurse called a 'fainting-fit,' and could with difficulty be got back to bed. Fifteen minutes later, she was in a condition of partial collapse, extremities very cold, skin pale, radial pulse just perceptible, respirations labored, and prostration very marked. Pain in the head, which she says she has had for two or three days. She was ordered heat to extremities and body, and ʒ ij of brandy every half-hour for three hours; then, ʒ ij every hour.

"This morning her condition is as follows: Partial hemiplegia of the left side, face included. Angle of mouth drawn to the opposite side. Tongue protruded to the left; pupils equal; no change in speech. Left arm and leg are partially paralyzed, as regards motion. Sensation of affected side normal. Temperature a little lowered. Grip feeble; no difference in radial pulses. Skin very pale, lips bluish, tongue coated white, not dry. Pulse very feeble, accelerated, and somewhat irregular. Prostration very marked. No pain in the head. Conscious. Abundant dry *râles* over the lungs in front. Behind, no examination was made, owing to her weak condition. Ordered brandy, ʒ ij every hour, and ammon. carbon. gr. v every third hour. 3 P. M., temperature 104$\frac{1}{5}$°. Ordered brandy, ʒ ij every half-hour. 5 P. M., respiration 32, pulse 96, temperature 102$\frac{1}{4}$°.

"*October 9th*, 9 A. M.—Pulse 110, soft and compressible; respiration 36; some tracheal *râles;* temperature 102°. Skin hot, dry, and bleached. Paralysis a little more marked. Tongue a little dry and coated white. Slept well. No cephalalgia. Pupils equal and respond to light. Says she feels well, but very weak. Takes little nourishment. Ordered brandy, ʒ ij every hour, and to continue ammonia. 5 P. M., respiration 28, pulse 96, temperature 101$\frac{3}{4}$°. Slept nearly all day. Is conscious, but stupid; a little wandering delirium. Answers rationally.

"*October 10th.*—Paralysis the same. She is very dull and drowsy. Involuntary evacuation of urine and fæces. Pulse 108, very feeble; respiration 38; temperature 102$\frac{1}{4}$°. Stimulants continued (egg-nog). 5 P. M., respiration 32, pulse 110, temperature 102$\frac{5}{8}$°.

"*October 11th.*—Respiration 24, pulse 116, temperature 103$\frac{1}{2}$°.

Paralysis the same. Pupils large. Eats some. Tongue clean. Bowels free. Temperature of the left side much diminished. 5 P. M., respiration 32, pulse 112, temperature 102⅝°.

"*October* 12*th.*—Respiration 40, pulse 120, temperature 103¾°. She appears a little brighter. 5 P. M., respiration 34, pulse 116, temperature 103¾°.

"*October* 13*th.*—Respiration 40, pulse 130, temperature 104¾°. Paralysis to-day complete. Affected muscles soft and flabby, and temperature low. Delirium a little more marked, wandering and incoherent. Marked thirst. No pain in the head. 5 P. M., respiration 36, pulse 128, temperature 104°.

"*October* 14*th.*—Respiration 28, pulse 120, temperature 103¼°. Constant wandering delirium. Slept some; answers rationally. Appears to be failing. Skin very dry and bleached. Tongue clammy. Abundant large and small mucous *râles* and some tracheal *râles* are heard in front of the chest. 5 P. M., respiration 30, pulse 138, temperature 104⅞°.

"*October* 15*th.*—Respiration 30, pulse 126, temperature 102°. She slept well by taking potass. bromid. More stupid this forenoon. Tongue dry and a little brown in the centre. Passes urine in bed, and she has two small bed-sores. 5 P. M., respiration 34, pulse 134, temperature 103¾°.

"*October* 16*th.*—Respiration 30, pulse 124, temperature 101⅜°. Abundant *râles* over the chest. Delirium and stupor more marked. 5 P. M., respiration 44, pulse 140, temperature 103⅝°.

"*October* 17*th.*—Respiration 36, pulse 130, temperature 102⅜°. Slept but little; still more delirium; says the same thing over and over. 5 P. M., respiration 36, pulse 148, temperature 105°.

"*October* 18*th.*—Respiration 60, pulse 140, temperature 102½°. Sordes on gums; dry tongue; muttering delirium. Slept none. Breathing labored. 5 P. M., respiration 32, pulse 144, temperature 104°.

"*October* 19*th.*—Respiration 54, pulse 140, temperature 102⅜°. 5 P. M., respiration 52, pulse 136, temperature 104⅞°. Is rapidly failing. At 12, midnight, respiration became labored and gasping.

"*October* 20*th.*—4.30 A. M. patient died."

Autopsy, by Professor Janeway, October 20th:

"*Exterior.*—Small bed-sores on the nates.

"*Brain.*—Right corpus striatum, for the most part, of a dirty

color and partially softened, and a small artery leading to it from the middle cerebral is obstructed at its point of origin, by a reddish-gray coagulum, not firmly adherent to the vessel. On the left side, a branch of the middle cerebral, supplying the island of Reil, is obstructed by a similar coagulum, and the outer half of the island of Reil is softened. In other respects the brain is normal.

"*Lungs.*—Considerable serum in the pleural cavities. Lower lobes compressed; upper lobes œdematous. No infarctions.

"*Heart.*—Normal size. Right cavities normal, and contain partly red and partly white post-mortem clots. Aortic valves normal. Left ventricle is filled with reddish coagula. Mitral orifice almost completely obstructed by a mass of vegetations, adhering to the valves on the auricular surface. The posterior leaf is thickened and a linear rupture exists, half an inch above the border. Around this is a mass of soft vegetations, through the centre of which and the ruptured valve, the blood flowed.

"*Liver.*—Large and congested.

"*Spleen.*—Twice the usual size, with a large, recent infarction, the artery of supply at this point being obstructed by coagula.

"*Kidneys.*—Exhibit several infarctions, some recent and red, arteries varying in color from white to yellow.

"*Peritonæum*, *stomach*, *intestines*, *uterus*, *ovaries*, and *ovarian veins*, all normal."

In a recent excellent treatise on apoplexy, by Lidell, you will find the reports of ten cases of cerebral embolism, but not one occurred in a puerperal woman; and the only case published by writers on this disease, which I now recall, is the one that occurred in the practice of Dr. Burrows, which I have quoted from Sir James Simpson. But, as I have now added three, all of which have occurred in this city within the past three years, I suspect that the reason why more cases have not been published is found in the fact, that the attention of obstetricians has not been directed to the study of this lesion.

Special writers on this subject tell us that the lesion is always preceded by characteristic premonitory symp-

toms. Niemeyer says, "These are not brain-symptoms, but those of the diseases which almost exclusively cause embolism of the cerebral and systemic arteries—that is, of valvular disease of the heart—of endocarditis and severe destructive diseases of the lungs." He asserts, also, "that the occurrence of these premonitory symptoms, and the presence or absence of valvular disease, endocarditis, or some disease of the lungs, have such an effect on the diagnosis that, with the same set of symptoms, we may diagnosticate embolism, if we find them, and exclude it with certainty if they are absent." Still, errors in diagnosis between cerebral embolism and cerebral hemorrhage have been made by some eminent men, and Bamberger, a high authority, considers it impossible always to avoid this mistake.

Age furnishes an indication of importance. In young persons, when hemiplegia occurs suddenly with an apoplectic attack, the presumption is in favor of embolism. Cerebral hemorrhage occurs chiefly, although not exclusively, in advanced age. Embolism may happen in a person of any age.

The symptoms of hemiplegia and apoplectic seizure are almost always suddenly developed, at the commencement of the attack, in cerebral embolism. In cerebral hemorrhage, these symptoms are generally developed more or less slowly; that is, one after another, and not all at once.

Another symptom of diagnostic value in cerebral embolism is the sudden occurrence of very acute pain in the affected part of the head. The patient frequently announces the attack by a scream. Cerebral hemorrhage is not usually attended with headache, but is more generally ushered in by a feeling of faintness or sinking.

LECTURE XIV.

PUERPERAL PHLEBITIS.

Case—Recovery—Two cases of death—Autopsical lesions—Three forms of puerperal phlebitis: adhesive, circumscribed suppurative, and diffuse suppurative—Ranvier's pathological histology—Uterine phlebitis—Symptoms: rapid pulse, rise in temperature, recurrent chills of moderate severity—Pain, generally not severe, but uterine tenderness—Abdominal tenderness and tympanites not symptoms of phlebitis—Involution not retarded by uterine phlebitis—Typhoid symptoms: rapid depression of the vital powers, delirium, subsultus, diarrhœa, profuse perspiration, profuse and very offensive lochia—Signs of purulent infection—Differential diagnosis of uterine phlebitis from peritonitis and metritis—Terminations of uterine phlebitis—Rapid death from septicæmia or embolism of the pulmonary artery—Recovery by resolution—Slow recovery by eliminative suppuration on the external surface—Death as a result of purulent deposit in serous cavities or in the parenchyma of important organs—Secondary bronchitis or pneumonia—Tendency of this disease to impair assimilation and nutrition, and subsequently to destroy life by marasmus or acute tuberculosis—Treatment.

"CASE XXIII.[1]—Ann Strohmayer, born in Germany, aged twenty-two, married, was delivered of her first child, a girl weighing seven and one-half pounds, at 12.20 P. M., November 22, 1871, after a short labor of an hour and a half. Although the placenta was partly forced into the vagina by the last pains which expelled the child, the uterus did not contract well, and there was some difficulty in removing the after-birth. The delivery of the placenta was followed by the escape of a large quantity of clots. Strong pressure was made on the uterus, but it did not respond, and ice was applied both externally and internally; but, for nearly a half-hour, there was a good deal of bleeding, and the uterus was constantly disposed to relax.

[1] Reported by John A. McCreery, M. D., house-physician, Bellevue Hospital.

Pressure was steadily kept up over the uterus by the hand of one of the house-staff or myself for over three hours before the bandage was applied. After this, for the succeeding twenty-four hours, the patient was very comfortable, with the exception of some severe after-pains, followed by the expulsion of clots. She appeared to be rapidly regaining her strength and color. Respiration 22, pulse 104, temperature 98.2°. As there was some tenderness over the uterus, turpentine-stupes were laid over the abdomen.

"*November 24th.*—Respiration 28, pulse 128, temperature 103°. Considerable tenderness over the uterus, which is not well contracted. No pain except at long intervals. Very little tympanites. Skin hot and dry; face flushed; tongue coated. Had a chill in the evening. Ordered quiniæ sulph. gr. v *ter in die;* tinc. aconit. gtts. v every two hours; suppository of the aqueous extract of opium, gr. j.

"*November 25th.*—Respiration 28, pulse 132, temperature 103°. Has vomited brown matters several times. Sweats profusely. Bad taste in mouth. Tongue thickly coated. In the evening, very little change; pulse, respiration, and temperature, same as in the morning. Has been delirious during the day. Bowels have not moved since her confinement, and a cathartic was ordered.

"*November 26th.*—At midnight, she began to vomit stringy mucus with a brown sediment. Bowels moved while she was vomiting, and she had severe bearing-down pains. The pulse fell to 80 in the night, and was, for a time, irregular. The aconite was stopped. The quinine was continued, and an opium-suppository was introduced. At 9 A. M.—Respiration 22, pulse 108, temperature 101°. Bowels moved several times, but she has not vomited since midnight. Lochia very free and exceedingly offensive. Ordered vaginal injections of carbolic acid. Evening.—Pulse and respiration same as the morning, temperature 100°. Ordered quinine by the rectum; afterward, opium-suppositories every two hours while the pain lasts, and as much egg-nog as she will drink. During the night, the pulse ran up to 120. Marked pain and tenderness over the uterus. Gave her gtt. xv of Magendie's solution of morphia.

"*November 27th,* 7 A. M.—Respiration 26, pulse 120, temperature 102°. Bowels moved several times during the night. Patient feels well, but the countenance is sunken and of a leaden hue. Sweats very profusely. Occasionally delirious—subsultus. Ordered, quinine, gr. xv, by the rectum, twice a day. Since the vaginal injections, the lochial discharges are much lessened in quantity, and the

odor is less offensive. Has had sharp, darting pains over the uterus, with marked tenderness.

"*November 28th.*—Respiration 20, pulse 104, temperature 101°. Patient is cinchonized. No vomiting or movement of the bowels since yesterday. Pain and tenderness over the uterus much less. From this time, her convalescence was steadily progressive, and, by the middle of December, she was perfectly well."

Gentlemen: I am sure that all of you who think must have asked yourselves the question, What is the meaning of these grave symptoms which appeared so soon after delivery? The labor was unusually short, it was followed by a pretty severe hemorrhage, but, in twenty-four hours, the patient apparently rallied from the effects of the loss of blood. Then she had chills, fever, a pulse from 128 to 132, a temperature of 103°, respiration 28. The lochia became profuse and exceedingly offensive, the nervous system was greatly depressed, as shown by vomiting, subsultus, and delirium, and all her symptoms were very discouraging for several days. What pathological process had been set up, which could cause all these phenomena and render the condition of our patient so critical for eight days after her labor? I shall ask your attention to a brief abstract of the report, by Dr. McCreery, of two other cases, which have just occurred in my service, the general features of which resemble, in the essential points, the history you have just heard. The light thrown upon the symptoms by the autopsical lesions, in these two cases, may perhaps aid us in answering the question:

"Case XXIV.—A married woman, born in Connecticut, was prematurely confined at the seventh month. The labor was easy and normal, but the child lived only an hour. The third day after her confinement, the patient began to cough, and auscultation revealed the existence of bronchitis. On the fourth day, she was slightly delirious. Pulse 140, temperature 104°, respiration 28.

Her bowels moved regularly. There were no abdominal pains or tympanites. She now began to have profuse sweating (she had before had chills); there was a peculiar sweetish odor of the breath; and the teeth were incrusted with sordes. The pulse ran up to 160, respiration 40, while the temperature fell to 101°. Finally, there was continued low muttering delirium, subsultus, hiccough, and she died on the thirteenth day after labor.

Autopsy.—The uterus was contracted down to nearly its normal size. Its cavity contained putrid, broken-down clots. The uterine veins were filled with a puriform fluid. The right Fallopian tube contained pus. There was a little serum in the peritoneal cavity, and slight fibrinous exudation on the peritoneal surface of the uterus. The lungs were congested, and the bronchial tubes contained muco-pus. Heart healthy. Liver medium size—its lower border covered with fibrinous exudation. Spleen large and soft. Kidneys of medium size, cortex thick."

"Case XXV.—A German woman, aged twenty-five, married, who was delivered, December 15th, after a perfectly natural labor, of her third child. She had a chill on the second day after delivery, and her pulse rose to 120, and the temperature to 102°. After this, she had repeated chills, profuse sweating, and delirium, but never complained of pain, except when pressure was made over the uterus. There was very little tympanites or abdominal tenderness. Her pulse ran up to 140, and her temperature, to 104°, but there was no essential change in her general symptoms, except those indicating a progressive failure of the vital powers. The lochial discharges were at first profuse and excessively offensive, but the use of injections of carbolic acid and warm water in a great measure removed the fetor. She died on the thirteenth day after delivery.

"*Autopsy.*—The uterus was found less contracted than usual at this period after delivery, measuring fully six inches in length. The inner surface was of a dark color, and coated over with bloody pus. The sinuses over the seat of the placental attachment were open, and pus could be squeezed from them. The uterine veins also contained pus, especially near the entrance of the Fallopian tubes. The right ovarian veins were enlarged and filled with thrombi, and some of them contained a purulent fluid. The vena cava contained clots, some of them a half-inch in length. The spleen was much enlarged and very soft. In the upper lobe of the left lung, there was an infarction the size of a large pea."

In these three cases, the general symptoms were very much the same in all, and they were the symptoms which have been regarded as characteristic of uterine phlebitis. In the two who died, the autopsical lesion common to both was uterine phlebitis.

I therefore take this opportunity to discuss this form of puerperal disease, in regard to which there has been a great deal written, and yet there is still great diversity of opinion among obstetric pathologists, as to its nature, frequency, and relative significance.

Some believe it to be the essential primary lesion of that fearful malady, puerperal fever. Others regard it as a rare secondary lesion of that disease. Others, again, deny altogether the existence of this as a primary pathological state, but regard it as always secondary to some blood-change. Others there are, who consider this as always the primary lesion of various secondary lesions of great importance; such as phlegmasia dolens, thrombosis, embolism, purulent infection, metastatic abscess, and so on.

As it is quite impossible for me to examine the various conflicting doctrines which have been held, and still find warm advocates, I must be content with the effort to make you understand the real nature of this lesion, to describe to you the symptoms which characterize it, and to tell you all I know about its treatment.

We are chiefly indebted for our knowledge of puerperal phlebitis to the original contributions of Dance, Tonellé, Mr. Henry Lee, of England, Behier, of Paris, and, more recently, to Virchow, of Berlin, and Charcot and Ranvier, of Paris. The micrographic researches of the latter on this point are given in the work on "Puerperal Diseases," by M. Hervieux, to which I have

before referred, and it seems to me that they conclusively establish certain facts in science which were before only conjectural.

We meet with three forms of puerperal phlebitis:

(1.) The term adhesive phlebitis has been applied to one form because, in connection with the evidence of inflammation of the coats of the veins, the circulation is found to be obstructed by fibrinous clots. Obliterative phlebitis would, perhaps, be a better term. The question has been much discussed, and is still unsettled, whether the inflammation of the vein be the cause or the consequence of the coagulation of the contained blood. In a former lecture, I have given you my reasons for the belief that thrombosis frequently occurs without either antecedent or coincident phlebitis. The doctrine of Virchow is, that the phlebitis is a consequence, and therefore secondary to the blood-change. I think a very strong argument in favor of this view is found in the fact that uterine phlebitis is a very frequent secondary lesion of puerperal fever, and is rare as a primary puerperal disease.

The absolute demonstration of this form of uterine phlebitis, where the uterine sinuses are filled with fibrinous clots, is thus given by Hervieux, as the result of the investigations of Ranvier :

In disintegrating these clots, the microscope reveals a great quantity of flattened epithelial cells of the veins, of a fusiform appearance, often united at their borders to the number of two or three. All of these cells present, in their interior, fatty granulations, very minute but clearly defined. By the side of these, other flattened and irregular cells are seen, which also contain fatty granulations. Other round cells, having a diameter from .015 to .02 of a millimetre,

in one or more nests, contain fatty granulations. There are, also, numerous cells, in appearance exactly like pus-globules, or white blood-globules, but all containing fatty granulations. There are, in addition, great numbers of free fatty granulations, and granules soluble in acetic acid.

As Hervieux remarks, the microscope proves that, in thrombosis of the uterine sinuses, the internal membrane of the sinus is denuded of its epithelium, and that there is a special kind of inflammation which gives rise, in the first place, to a considerable multiplication of plasma-cells, and then to a fatty granular degeneration of proliferous cells. With the change which takes place in a thrombus, and its gradual dissolution, there is often a change in the coats of the vein; its muscular coat is bedimmed with fine granular elements, and is softened or destroyed, and small purulent collections are sometimes found in the external coats. By the destruction of the walls of the vein, there sometimes results abscess in the contiguous uterine tissue. Similar results also may occur, from the dissolution of thrombi in veins other than those of the uterus.

(2.) Another form is the circumscribed suppurative phlebitis, in which the veins are found to contain pus, or a puriform liquid between the clot and the vein, or sometimes real cysts, with a clot, above and below, in the vein. The different coats of the veins may be infiltrated with pus. Sometimes the suppuration is limited to the external tunics of the vein. In other instances, the internal coat is destroyed, as a sequence of the inflammation of the external coat, just as the cornea is sometimes destroyed as a sequence of conjunctivitis, and then the cavity of the abscess communicates with the cavity of the vein, and pus is mingled with the blood.

(3.) Diffuse suppurative phlebitis is not very rare, in phlebitis of the veins of the lower extremities. I shall reserve my remarks on this form for another occasion, when I discuss the subject of pyæmia.

The anatomical seat of puerperal phlebitis may be the veins in any part of the system, the veins of the uterus, and other veins in the pelvic cavity, in those of the lower, but rarely those of the upper extremities.

I remember a case of extraordinary interest, published, I should say, some fifteen years ago, by that honest and indefatigable worker in obstetric pathology, Dr. A. H. McClintock, of Dublin, of puerperal phlebitis, in which the veins involved were the jugulars, the subclavians, and, if I am not mistaken, the innominata.

But uterine phlebitis is the more common form; it is the form which we now have encountered, and, with these few remarks, my observations will relate chiefly to this. I do not regard this as a disease of very frequent occurrence, either in hospital or in private practice, except when there is epidemic or endemic puerperal fever; yet, every year, I see some two or three cases.

The symptoms of this affection have been carefully studied by numerous observers—among whom, M. Behier, of Paris, should be mentioned as one of the most zealous and competent. M. Hervieux also gives an admirable description of the phenomena which characterize this lesion.

All writers agree that the initial symptom of this affection is most frequently a chill, generally of moderate severity. It is true that there is sometimes one severe rigor, but, as a rule, it may be said that the chill consists rather of irregular and repeated sensations of shivering, induced by the most trivial causes, as the

movement of the bedclothes, turning in bed, or the opening of a door. There is a marked tendency to recurrence of these chills for several days, but without periodicity; that is to say, they come on irregularly, and are unequal as to their duration and intensity.

Immediately in connection with the chill, there is increased frequency of the pulse, which generally rises to 110 or 120 per minute. The temperature also shows a corresponding rise, from 101° to 103° Fahr. The respiration is somewhat hurried, ranging from 24 to 28 or 30 per minute.

The appetite is lost at the very onset of the attack; patients frequently complain of a bad taste in the mouth, and the tongue is, at an early period, covered with a thick, white coat. Some authors speak of urgent thirst as a common symptom, but, in my observation, this is not usually the case. There is simply a desire to wet the mouth, to clear it from a disagreeable taste.

There is generally, but not always, a moderate complaint of pain, referred to the uterus. This is not acute, nor does the patient usually speak of it, except when questioned, and she then often speaks of it as being only felt in certain movements, or when she coughs, or when pressure is made over the uterus.

There is not usually any considerable tenderness or tympanites of the abdomen, nor is there much sensitiveness to pressure, except when lateral compression of the uterus is made. If the fundus uteri be fixed between the thumb and fingers, and then the pulp of the fingers be rubbed along the sides of the uterus, painful points are usually very apparent. But this sign is only of value for the first two or three days, as the sensitiveness to pressure disappears.

In this affection, there is not necessarily either induration or tumefaction of the uterus. It is a curious fact that involution of the uterus does not seem to be retarded by uncomplicated uterine phlebitis. In one of our cases, the uterus was contracted down to nearly its normal size; and I have seen other cases, which confirm the observation of Hervieux, that the uterine sinuses may be full of pus in a uterus, the tissue of which is perfectly healthy, and is contracted down to its normal size. If the phlebitis be complicated with metritis, of course there will be tumefaction.

On vaginal examination, the cervix is found soft and patulous, sufficiently so to admit the first phalanx of the finger; and, if the phlebitis be not complicated with inflammation of the adjacent tissues or with metritis, the uterus is movable in every direction, and not very sensitive to pressure.

In phlegmasia of the other tissues in the pelvic cavity, the initial symptoms may be much more intense and striking; but, in uterine phlebitis, one of the most characteristic features is the rapid depression of the vital powers. The patient looks very ill, which, to the inexperienced, seems in striking contrast with the comparative mildness of the symptoms. Her countenance bears an expression of indifference to every thing around her, her look is vague, gloomy, and oppressed, sometimes stupefied, and she is rarely seen to change her position in bed.

I have never seen, in this disease, the aggregation of symptoms which Dr. Meigs describes as hysteroid intoxication; and it seems to me that his sketch, undoubtedly drawn from Nature, belongs rather to a certain phase of puerperal mania.

But there is usually, at quite an early period, con-

siderable cerebral disturbance. When the patient has a high fever, a pulse of 120, temperature of 103°, a dry tongue and diarrhœa, she will assert that she is quite well. There is manifest incoherence in her ideas, and, in most cases, especially during the night, a mild, tranquil delirium. Hervieux mentions an exceptional furious delirium as sometimes occurring, but this has never been manifested in any of the cases that I have seen.

The skin is at first hot and dry, in some cases; in others, it is moist, and, as the disease advances, there are profuse and irregular perspirations.

The lochial discharge is occasionally suppressed for a day or more, in the commencement of the disease; but, in my observation, this is the exception rather than the rule. More frequently, as in the three cases that we have just had in the hospital, the lochia are at first greater in quantity, sometimes almost amounting to hemorrhage, and they are almost invariably excessively fetid. It is not uncommon, however, to see these discharges entirely cease two or three days before the disease terminates fatally.

In nearly all of the cases, there has, sooner or later, been a marked tendency to diarrhœa, and, in a less degree, to vomiting. The fecal discharges are generally at first dark, and afterward become black and exceedingly offensive, and, near the end, they are involuntary.

You observe that this disease rapidly tends to develop a typhoid condition. There is subsultus. The mouth becomes so dry that articulation is very difficult and indistinct, the teeth are covered with sordes, and, a little time before death, delirium is succeeded by coma.

You will find that some authors believe that the

symptoms which I have just enumerated only occur when there has resulted, from the phlebitis, purulent infection. But others besides myself have seen all these symptoms in cases where the most careful research has failed to detect any evidence of purulent infection.

The evidences of purulent infection are found in a peculiar yellow tinge of the skin, in painful swellings in one or more of the articulations, in phlegmons in any part of the system, in mammary abscess, in purulent ophthalmia, or in the signs of pulmonary infarctions.

Gangrene of parts which are subjected to pressure, as the sacrum, the trochanters, or the heels, is not a very rare sequence of this disease.

The diagnosis of uterine phlebitis must be based on a careful analysis of the symptoms, and a just appreciation of the physical signs. It is often one of the most dangerous and important of the secondary lesions of puerperal fever. It also occurs often as a primary lesion, complicated with peritonitis or with metritis. But I believe that it occurs, and not very unfrequently, as an uncomplicated primary disease of the puerperal state. The other puerperal phlegmasiæ with which it may be confounded are metritis and peritonitis.

Metritis arrests the process of involution, and hence, in this affection, the organ is always found decidedly larger than it should be at the given puerperal period, indurated and very sensitive to manipulation. It is also characterized by more persistent and severe idiopathic pains in the organ, but, at the same time, very much less grave constitutional disturbances. Recurrent chills, profuse sweats, subsultus, diarrhœa, delirium, with a rapid tendency to a typhoid state, are not symptoms which belong to metritis.

To one not much accustomed to see puerperal disease, the general appearance of a patient suffering from uterine phlebitis would seem to resemble very much that of a patient with peritonitis. In both, there is a kind of *vis inertiæ*, an indisposition to move or turn in bed. In both, the countenance may bear the stamp of a stupid, vague gloom, although, in peritonitis, this is at first accompanied with a more marked expression of suffering and pain; and in both there is a marked tendency to low delirium. In short, both diseases rapidly enfeeble innervation.

In peritonitis, the pain is usually very severe, and even when the inflammation is confined to the serous membrane in the pelvic cavity, if pressure be made on the lateral vaginal *cul-de-sacs* or in the iliac fossæ, there is exquisite tenderness, while, in phlebitis, the tenderness to pressure is chiefly evident on the lateral portions of the uterus. It is true that, in puerperal fever, the peritoneal lesions may be very severe, and yet the intense pain and sensitiveness to pressure which characterize puerperal peritonitis may be absent, but, in these cases, the diagnosis is cleared up by the tumefaction and tympanites, which are generally present in peritonitis.

Again, peritonitis is sometimes ushered in by one chill; while, in phlebitis, the chill is generally much less severe, but it is repeated and irregular in its recurrence. It is true that we sometimes meet with successive and progressive attacks of inflammation of the serous membrane, and, with each onset, there may be a renewal of the chill, but there are also corresponding local signs of the progressive disease. Each chill in peritonitis is attended with a new development of acute pain and new points of sensitiveness to pressure, and

in these points there are manifest tumefaction and increase of the tympanites.

In phlebitis, the repeated chills are not attended with a new access of pain; but, on the contrary, the nerve-sensibilities seem to grow less keen, and the pain is not complained of, except in answer to interrogation on this point.

Having decided that you have to deal with a case of uterine phlebitis, your next inquiry is, How is this disease to result, what is its duration, and what are its terminations?

The duration of this affection is greatly modified by the character of the attack, and the epidemic type of the season. In some cases, the attack is overwhelming, the inflammation rapidly extends from the uterine sinuses to the pelvic veins, and perhaps still farther to the veins of the extremities, or to the vena cava, and an early fatal issue is to be apprehended. This result may be due to one of two causes; either to rapid poisoning of the blood, septicæmia, which occurs at an earlier period than suppuration and purulent infection; or, the death may result from secondary thrombosis or embolism of the pulmonary artery. In each of these ways, uterine phlebitis sometimes terminates fatally in two, three, or four days from the time of the attack.

The violence and intensity of the symptoms which usher in the attack afford a very uncertain basis on which to make a prognosis as to the duration or the termination of this disease. In our patient who has recovered, the symptoms, the first four days of her illness, were much more severe than in the two patients who died. I have seen a number of cases, more in private than in hospital practice, where the diagnosis of this disease has seemed to me conclusive, as proven by

the irregular, recurrent chills, the local uterine signs, negative and positive, and the rapid development of the usual typhoid symptoms, to such a degree that death seemed to be the only possible termination, and yet, entire recovery has taken place after an illness of ten or fifteen days.

When secondary purulent infection occurs as the result of uterine phlebitis, the disease may be prolonged for weeks, and then terminate by recovery or death.

We may anticipate recovery under these circumstances, when there is a subsidence of the general symptoms, at the same time that there is a tendency to purulent deposits on the external surface, as in the breasts, or in the connective tissues of any part of the system, more frequently on the legs or the arms, generally near the joints. It is by this process that the pus is eliminated from the blood.

But the deposits may take place in the serous cavities, as in the peritonæum, the pleura, or the pericardium, or in the parenchyma of important organs, as the lungs, the liver, or the kidneys. Under these circumstances, death occurs sometimes several weeks after the original attack of uterine phlebitis.

There is another sequela to uterine phlebitis and purulent infection, which I have never seen alluded to by any writer on this subject, but which, for years, I have been accustomed to mention to medical classes, and to those gentlemen in the profession who have done me the honor to call on me in consultation.

In certain patients who have apparently recovered from the immediate consequences of the phlebitis and the purulent infection, the disease seems to have so impaired the functions of nutrition and assimilation, that the woman breaks down and dies from marasmus. I

think that every year we have one or more such cases in this hospital. In some instances, they die from acute tuberculosis. I have, strongly impressed on my memory, the case of two ladies, one of whom died in 1856, and the other, in 1862. They were equally lovely in character as in person, surrounded by every thing which seemed to promise a happy and a long life, and in neither of them could the slightest hereditary tendency to tuberculosis be traced, but both had, following their first parturition, uterine phlebitis, and, apparently recovering from this, died some months after, from acute phthisis. These cases were quite distinct from the bronchitis and pneumonia which are now well recognized secondary results of this affection.

I must also mention, as other occasional secondary results, an erythematous or erysipelatous condition of the skin, appearing on some parts of the body, but which does not terminate in suppuration and bed-sores.

Treatment.—1. I should say, first ascertain the functional indications, especially those relating to the excretions. If a laxative be needed, and there be no marked peritoneal complications, select such as will effectively evacuate the alimentary canal, without producing local irritation or depressing the vital powers. If the urinary excretion be deficient, carefully investigate whether this be due to the kidneys or the bladder. If there be evidence of renal hyperæmia or of cystitis, one or the other of which is very frequently met with in the commencement of an attack of uterine phlebitis, this special indication should at once receive its appropriate therapeutics. Thus, at the commencement of my treatment of this affection, I generally find it necessary to apply cups over the kidneys, or to give alkaline diuretics, as the citrate or the acetate of pot-

ash, or perhaps to use the catheter. These are points in the treatment which should not be overlooked.

2. Allay those vital disturbances which the shock of the attack produces.

(*a.*) Vascular excitement. Formerly, venesection was regarded as the chief agent for reducing vascular excitement, and there is no doubt that, in some cases, this measure was tolerated, and proved of great service. But, as we have seen, this disease rapidly tends to depress the vital forces, and every thing which accelerates such a result should be avoided. We have, however, two agents in our materia medica which act specifically as vascular sedatives. These are aconite and veratrum viride. Simply as a vascular sedative, I greatly prefer the veratrum viride (for reasons which I shall not now stop to discuss), and I think this is the fact with all who have had any considerable experience in the use of both, but I must tell you that this class probably constitutes but a small minority in the profession. I meet with many who have a great fear of the veratrum viride, because it sometimes produces the appearances of dangerous collapse. But this is a very temporary condition, which, so far as I have heard, has never terminated disastrously. The appearance of one who has taken too much veratrum viride is almost precisely like that produced by tobacco in those unaccustomed to its use. I have often seen this, but now, when I do, it causes no alarm, as I am sure that the effects will soon pass off. There is no objection to assisting reaction in such cases, by carbonate of ammonia, or small quantities of some alcoholic stimulant. In a small percentage of cases, it is quite liable to cause nausea, but this is readily counteracted by giving it in combination with the tincture of ginger. As to its positive effects, I will say, that you

can, by it, absolutely and certainly control the frequency of the pulse of inflammation and of irritation, but, of course, if it will accomplish this, you would not expect it to reduce the rapid pulse of exhaustion, as found in the last stages of phthisis or in typhus fever.

But, I must also add that the use of veratrum viride is not incompatible with stimulants. My experience has abundantly demonstrated the truth of this apparent paradox. In one case, the veratrum viride did not seem to produce any effect on the pulse, which remained constantly above 130, until the condition of the patient was such that I decided to give brandy. After the first ounce had been given, it fell to 108; after the second, to 86. Continuing the brandy, the veratrum viride was suspended for a few hours, and the pulse again rose to 130. After this, it was curious to note the fact, that if the use of either agent were suspended, the pulse would rapidly increase in frequency, while, under the combined influence of the two, it was kept below 80 per minute. Another of my patients, who recovered, took one ounce of brandy and from three to ten drops of the tincture of veratrum viride, every hour, for two days, the quantity of the veratrum viride being regulated by the frequency of the pulse, which was never allowed to rise above 80 per minute, although it sometimes fell to 40.

The directions which I generally give to my staff in this hospital are, to begin the use of the veratrum viride at once, and, carefully watching its effects, bring the pulse down to 80, and hold it there. After the specific effect of the veratrum is once produced, it can be kept up by very much diminished doses.

(*b.*) Nervous irritation. Opium is the great agent for allaying this. It is desirable in this disease to save

the stomach as much as possible, and I therefore generally administer the opium either in the form of rectal suppositories, one grain of the aqueous extract to three grains of butter of cacao, or else in the form of hypodermic injections of the solution of morphia. Throughout the whole course of this disease, I believe the use of this agent to be most essential. It not only allays pain, but is also of great service in promoting sleep, quieting delirium, and checking the tendency to diarrhœa. The quantity required to accomplish these ends is generally not large, nothing like what is required in some of the other phlegmasiæ, more especially peritonitis, nor is there a necessity for its frequent use, for I often find it sufficient to use an opiate at night only.

3. I have before alluded to the great danger from septic absorption, and to the fact that septicæmia sometimes causes death at a very early period, before the process of suppuration has commenced. The prophylaxis against this danger is therefore one of the most essential and important elements in this, as well as in other puerperal diseases. The necessity of frequent changes of the napkins worn to absorb the lochial discharges, of the greatest cleanliness of the person, clothing, and bedding of the puerperal woman, and of thorough ventilation of the room, are points of the greatest importance, which the physician should strenuously insist upon and personally supervise. You will meet with many monthly nurses who are excessively apprehensive of danger by cold from necessary ablution, from change of soiled clothes, or from admission of pure, fresh air into the room, but who have not the slightest fear that the woman under their charge will become a laboratory for the generation of septic poison. I am always on the alert for mischief ahead when, on

my first visit to a patient after her accouchement, I find her perspiring under a load of blankets, the air and light excluded from the room by closely-drawn, heavy curtains, or thick shawls fastened before the windows, with one of those nurses who "does not believe in changing the napkin any oftener than is absolutely necessary," or in "washing a second time after labor until after the third day." The number of nurses who believe in such and other equally absurd and pernicious theories is, I suspect, much greater than is generally supposed by medical men who have not taken the pains to inquire curiously on this point, with the art and skill of a detective.

As regards medicinal prophylaxis, I have but one suggestion to make, but I regard this as one of great importance. I refer to vaginal injections of warm water and carbolic acid, in the proportion of five grains or more to the ounce. Where there is any liability to septicæmia, these injections should be used every three or four hours. It is absolutely certain that they most effectually correct the offensive odor, and diminish the quantity of the lochial discharges.

I have now had several years' experience in the use of vaginal injections of carbolic acid, but, a year ago, I gained new light on this subject from my friend, Dr. J. D. Trask, of Astoria, formerly Professor of Midwifery and Diseases of Women in the Long Island College Hospital.

In the *New York Medical Journal*, for October, 1871, you will find the report of a case by Dr. Trask, which was certainly the most remarkable recovery from septicæmia and a complication of other puerperal diseases that I have ever seen. The facts pertinent to my present subject may be thus briefly stated: On the third

day after labor, the patient exhibited symptoms of septicæmia in the highest degree and in its most dangerous forms. She had a severe rigor, followed by high febrile action, alternating through the day with oft-recurring chills of short duration. In the afternoon, when Dr. Trask saw her, there were heat, profuse sweating, extreme restlessness, tenderness over the uterus, urgent diarrhœa, the dejections being involuntary, and of intolerable odor, and a pulse of 160.

Dr. Trask regarded it as a case of septicæmia, complicated with peritonitis, and he determined to attempt to impregnate the system as far as possible with carbolic acid. He at once commenced its administration by the mouth, rectum, and vagina. A half-drop of Calvert's solution was given in mucilage by the mouth every two hours. The solution for the rectum was one drop, increased to five drops to an ounce of mucilage, a half-gill being thrown up after every dejection. The vaginal injection was not less than five drops to the ounce every three or four hours. There was, at the time, a supposed idiosyncrasy forbidding the use of opium. Within twenty-four hours, the diarrhœa ceased, and the pulse was reduced to 120. The inflammatory symptoms were after this in the ascendant, while the signs of septicæmia were in abeyance. "The system seemed to be saturated with carbolic acid. She tasted it in every thing, inhaled it, as she thought, in every breath (I cannot say that she exhaled it), and was so disgusted that she refused to have it longer brought to the bed for any purpose. No other antiseptic was substituted by the mouth, but the bisulphate of lime, or the permanganate of potash, was employed abundantly in vaginal injections, until convalescence began."

Since I saw this patient with Dr. Trask, I have had

the opportunity of carrying out a similar treatment in only three cases, but the results of these were so satisfactory, that I shall hereafter give this plan of saturating the system with carbolic acid a thorough trial.

4. The importance of keeping up the vital powers, by giving the best nutrition that can be assimilated, by stimulants and tonics, is so obvious that I need not detain you by any prolonged observations on this point. The tonics on which I chiefly rely are the tincture of the chloride of iron and the chlorate of potash, fifteen drops of the first, and ten grains of the latter, every third hour. But, when the signs of purulent infection are present, quinine is the great resource. I always desire that it shall be given in doses up to the full point of tolerance. Patients who are suffering from purulent infection frequently take, for three or four days, from twenty to thirty grains of quinine a day, without complaining of ringing in the ears or any other symptom of cinchonic intoxication.

I should hardly be doing justice to you if I gave you only my own treatment of this affection. I must therefore tell you that M. Hervieux, whose great work was published last year, and whose experience in this disease at the *Maternité* must have been very large, recommends an emetic of ipecac at the commencement of the attack. He believes that this will produce a good effect in three ways: 1. By relieving the gastric irritability. 2. That it weakens, but does not aggravate, the violence of the initial symptoms of the attack. 3. That it eliminates the toxic elements which otherwise Nature seeks to carry off by the diarrhœa.

He also recommends, as revulsive treatment, the application of from six to ten wet cups over the hypogastrium. But he seems to have the greatest faith in

mercurial inunction, carried to the extent of producing salivation, and he regards the salivation as a most promising sign of recovery.

Even at this day, I now and then meet with physicians who tell me that they never lose a case of typhus or typhoid fever when they are able to salivate the patient. I cannot express an opinion founded on experience, as to the usefulness of the treatment advocated by M. Hervieux, neither do I regard it as probable that I shall ever be able to do so.

LECTURE XV.

PUERPERAL METRITIS.

Case—Puerperal metritis very frequently a prominent lesion of puerperal fever, and generally found associated with peritonitis or phlebitis—In this case, complicated only with cystitis, which is not uncommon as a puerperal disease—Puerperal metritis includes endometritis and parenchymatous metritis—Metritis frequently the primary lesion, in the development of phlebitis or peritonitis—Physiological modifications of the mucous membrane of the uterus during the puerperal period—Pathological anatomy of puerperal metritis—Causes—Symptoms—Duration and terminations—Treatment.

"CASE XXVI.[1]—Bridget ——, aged thirty-four, widow (husband died at Blackwell's-Island Hospital in September last), was delivered of her eleventh child, a boy, weight nine and a half pounds, December 11th, at 9½ A. M.; first stage two hours, second stage one-half hour, third stage five minutes, L. O. A. Considerable hemorrhage followed the rapid and spontaneous expulsion of the placenta. Uterus did not contract well, and 3 j of tincture of ergot was given three times, and constant pressure over the fundus was kept up for nearly two hours before the binder was applied. For three days, the patient suffered much from after-pains, which opiates seemed to have very little influence in mitigating. Bowels moved without medicine on second day. No milk-fever. Mammary secretion was very abundant on the second day, so that, for six days after, she voluntarily nursed another child besides her own. Lochial discharges very free and very high-colored. In all other respects, patient apparently doing well.

"*December 19th.*—For the first time, it was observed that the lochial discharge had an offensive odor, and was still very red and

[1] Reported by N. S. Westcott, M. D., house-physician to Bellevue Hospital.

profuse. Patient has no appetite, feels weak and 'good for nothing,' and has had very little milk in the breasts for the last twenty-four hours. No pain anywhere, has had no chills, no fever, very little thirst, and complains of nothing but weakness. Ordered vaginal injections, one part of Labarraque's solution in twelve parts of warm water, night and morning. Quiniæ sulph. gr. ij, *ter in die.*

"*December 20th.*—Examined by Professor Barker before the class. Decided emaciation of the face, and countenance anxious. Tongue covered with a thin, whitish coat. Gums very white. Pulse 96. Skin natural, and no heat of surface. No appetite or thirst. Hardly a drop of milk could be squeezed from the breasts. No pain anywhere. Sleeps pretty well, but wakes up tired. Lochial discharge red, very free, and still quite offensive. Abdomen flat, walls thin and yielding, with no tenderness on pressure. The ovoid tumor of the uterus very easily mapped out three and a half inches above the symphysis pubis. Borders of tumor moderately sensitive to pressure. She turns and moves in bed, coughs, etc., without the least pain. On vaginal examination, the cervix was found so high up in the pelvic cavity, that the second finger only could reach it. Os very large and patulous, and not tender on pressure, except when pressure is made at the same time by the other hand on the fundus. Uterus not easily and only slightly movable. Patient now says that 'it has been hard work, and hurt her to pass water for three or four days.' Catheter was passed, and five ounces of turbid, offensive urine were drawn off, which, on subsequent examination, was found free from albumen, but contained a good deal of mucus and some pus-globules. Dr. Barker prescribed—

℞. Fld.-ext. ergot.,
Tinc. nucis vomicæ, āā ℥ iij.
Tinc. ferri chloridi, ℥ v.
Aq. puræ,
Syr. simp., āā ℥ ij.

M. S. A tablespoonful, in a little water, every fourth hour.

"*December 21st.*—Patient feels stronger, and passes water without pain, and in much greater quantity. Has more appetite. No milk in the breasts. Pulse 104. Skin natural. Lochial discharge less, and of a lighter color, but still very offensive.

"*December 22d.*—Pulse 116. Countenance not so good. Has had, since 4 A. M., three large and offensive, black, thin evacuations from the bowels. Appetite gone, and she complains that the medicine sickens her. The uterine tumor very palpably diminished, as

it now can only be felt an inch and a half above the pubes. Ordered to have two teaspoonfuls of the mixture every third hour.

"*December 23d.*—Patient looks badly. Pulse 120, weak and compressible. During the night, she had several times complained of being chilly, with slight shivering, but, when the nurse covers her more warmly, she soon complains of heat, and throws off the clothes. Has not retained the last two doses of the medicine given. Dr. Barker finds the fundus uteri about two fingers' breadth above the pubes. The lochial discharge is much less, and of a darkish-brown color. On vaginal examination, the cervix was much lower in the pelvic cavity, os large and open, so that the finger could be inserted more than an inch. Not painful on pressure, even when compressed between the fingers on the cervix and the fingers of the other hand over the fundus uteri. The odor on the fingers withdrawn from the vagina was so unexpectedly offensive, that Dr. Barker (not the patient) instantly vomited most freely. The mixture was discontinued. Quiniæ sulph., gr. iij, was ordered every third hour, and a half-ounce of whiskey every hour. Vaginal injections of warm water, made as strong with Labarraque's solution as she can bear without smarting, were to be given every fourth hour. She took but two doses of the quinine, and the whiskey four or five times, when the stomach began to reject every thing taken. She sank rapidly during the evening, and died at 2 A. M., December 24th.

"*Autopsy, thirteen hours after death.*—Some slight, old pleuritic adhesions to the left lung, but all the thoracic organs healthy. Spleen normal, of moderate consistence, but perhaps a little paler than usual. Kidneys healthy.

"*Peritonæum.*—No effusion of any sort in the cavity; membrane of a perfectly healthy color in every part, and but a slight adhesion of a knuckle of intestine over the fundus uteri.

"*Bladder.*—The mucous membrane, thickened and mottled, with irregular patches, of a reddish-brown color. Its surface covered with mucosities, mingled with a yellowish, purulent matter. The *ovaries*, *Fallopian tubes*, and *broad ligaments*, normal.

"*Uterus.*—Weight 18 ounces, length 7½ inches, breadth 5½ inches. The muscular walls of the uterus were generally of a dark-purple color, or, in circumscribed portions, of a yellowish color, soft and flabby, and contained numerous purulent collections. The cavity contained, perhaps, two drachms of a dark-brownish, extremely fetid fluid. The mucous membrane was of a dark-brownish color, seemed swollen and much thicker than usual, and there were nu-

merous patches of dark-brown shreds, which could not be washed off, but were easily detached. The placental seat was irregular in its form, and, after water was poured over it, of a dark-grayish color."

Gentlemen: You have just listened to the history of the case of the patient who was brought before you last week. You were perhaps, surprised, as was Dr. Westcott, to hear me express such grave apprehensions as to the result of the case, when there were so few salient or striking symptoms indicative of severe illness. She had had no chills, no fever, no thirst, her tongue was but slightly coated, her pulse was but 96, after she had been brought to this room. She had no pain anywhere, she slept well, she could turn, move or raise herself in bed without pain or difficulty, and she answered questions brightly and intelligently. She seemed rather to enjoy being brought before you, as patients often do, feeling that their case is one of special importance, and that they are receiving a great deal of medical attention. In four days after you saw her, she died. You will remember that I pointed out to you the very unusual size of the uterus, for the ninth day after delivery, which was easily demonstrable to you all, as the abdominal walls were very flat and yielding.

In physiological convalescence, the uterus disappears below the pubes, from the sixth to the tenth day after parturition; in primipara, at the earlier period, and later in the multipara, somewhat in proportion to the number of children borne. Now, if there be an arrest of the process of involution, so that, by the ninth day, the fundus is three or four inches above the pubes, we may be well assured that some morbid element exists, of sufficient importance to demand careful examination.

In this case, the uterus did not contract well af-

ter delivery, and there was a marked tendency to hemorrhage; the lochial discharge had been unusually large, and had continued of a red color much longer than usual, with an offensive odor. The mammary secretion, which at first was very large, had entirely ceased. I therefore expressed the opinion that, although the case was in many respects exceptional, it would prove to be a very grave case of metritis.

The uterus is on the table, and will be passed around for you all to examine; and, although two days have elapsed since it was removed from the body, but little change has taken place, except as to color. Now, there is nothing very remarkable or exceptional in that uterus. I have seen many like it, varying only in degree and extent, taken from patients dying from puerperal fever, or when this condition of the uterus was associated with peritonitis or phlebitis. But, in my experience, it is unique, in that it is not associated with puerperal fever, of which there has not been a case in the hospital for some months, nor with any other lesion of the pelvic organs, except cystitis, which, by-the-by, I regard as a more frequent and important puerperal disease than is generally suspected.

This uterus is an excellent specimen of puerperal metritis, which includes both inflammation of its mucous membrane, or endometritis, and inflammation of its muscular walls, or parenchymatous metritis. This is a very common and a very prominent lesion of puerperal fever in some epidemics, and, in others, it is never found. We have also reasons for believing that it is frequently the primary lesion in many cases of general or local peritonitis, and in many of the suppurative inflammations of the other pelvic tissues. I am not aware that any case has yet been reported of inflammation of

the walls of the uterus, unassociated with endometritis, and hence it has been inferred by some that it always commences as an endometritis. But there is no proof of this, and I think it very doubtful. We generally find the two affections associated, but I shall be able to give you a more clear idea of both, if I describe each separately.

Before studying the pathology of endometritis, let us first see what are the physiological modifications of the mucous membrane of the uterus after parturition. These modifications, as described by Robin, are as follows: There is a marked difference between the mucous membrane of the placental seat and that which covers the rest of the internal surface of the uterus. The placental seat, which, before delivery, measured from six to eight inches in diameter, is reduced, after delivery, to three or four inches, and this decrease of surface is constantly progressive. The form of the placental seat also changes: at first being nearly circular, it becomes irregularly oval, its long diameter corresponding with the long diameter of the uterus, with irregular, sinuous, notched borders. Thus, according to Robin, what the mucous membrane of the placental seat loses in extent of surface, it gains in thickness. At the same time, it wrinkles up, becomes rugous and mammillated, and of a brownish color, softening gradually until it becomes of a pultaceous consistency. The borders of this membrane are irregularly projecting, and very adherent to the circumference of the placental seat, where it is continuous with the mucous membrane which covers the rest of the inner surface of the uterus. The salient projections of this part are due to vascular dilatations, easily demonstrated by careful minute dissections. An incision made

through the mammillated projections shows, immediately beneath the mucous membrane, a hollow areolar tissue, resembling erectile tissue. In proportion as the time becomes remote from the period of parturition, these vascular dilatations atrophy and become obliterated, the mammillated projections contract and flatten, and there only remains, at the placental seat, a reddened portion, more prominent than the rest of the surface, which is easily distinguishable for a long period, until the physiological repair is complete.

The part of the mucous membrane which covers the rest of the surface of the uterus is smooth, almost shining, and bedewed with a reddish secretion, and is altogether quite different from that of the placental seat. The serotine membrane disappears slowly by exfoliation, and, according to Kolliker, the new mucous membrane is not fully reproduced until the end of the second or third month.

Some authors have expressed the belief that the uterine sinuses are closed, after the detachment of the placenta, by a physiological thrombosis of these vessels. But I am in accord with Hervieux, in the belief that they are closed by the contraction and compression of the tissues in which they are embedded, and that, when fibrinous clots are found blocking up these sinuses, they are the result of some morbid process, either from the violence of the separation of the placenta, or some pathological change in the surrounding tissues.

Inflammation of the mucous membrane of the uterus arrests these physiological changes, and causes numerous modifications, varying in degree and intensity in proportion to the exciting causes and under different epidemic influences. If an opportunity occur for examination of the uterus, in the early stages of puerperal

endometritis we find the mucous membrane covered with a thick, viscous, reddish coating, which consists of epithelial *débris*, and mucus, blood, and pus-globules. This covering is easily detached, by scraping with the back of a scalpel, or even by pouring upon it a stream of water. Beneath this, the membrane is found decidedly thickened, especially at the placental seat, the color varying from a light to a dark-brown red. If the disease have advanced to the suppurative stage, we find yellowish or reddish-gray purulent flakes lining the internal surface of the uterus, the most thick and consistent of which are over the placental seat. When this is washed off, the mucous membrane beneath is more or less softened, as if macerated in the purulent fluid to a greater or less depth, extending, in some cases, even to the muscular walls of the uterus. An incision made in the placental cotyledons reveals its sinuses, some of which are filled with dark blood, partly liquid and partly coagulated, others containing yellowish, puriform concretions. In some, these fibrinous concretions are softened to that degree, that pressure causes drops of pus to gush from the open sinuses of the internal surface of the uterus, or from the surface of the section. The odor from the surface is very strong and marked, but can hardly be called fetid. Sometimes false membranes, to which the German writers apply the term diphtheritic, of variable size and extent, are found over the internal surface of the uterus, particularly over the cavity of the cervix and the placental seat. In still more severe and advanced cases, the internal surface of the uterus is covered by a greenish-brown or black putrilage, which has a most excessively fetid odor. In very severe epidemics, we meet with cases of real gangrene of the mucous membrane of the uterus. The en-

tire internal face of the uterus is covered with a greenish-black or black pulpy matter, which gives an overwhelming, gangrenous odor.

Endometritis frequently occurs without involving any pathological changes in the walls of the uterus, but I am not aware that any instance has ever been published in which parenchymatous metritis has existed without endometritis. Indeed, it is the opinion of Klob, that inflammation of the substance proper of the uterus, in the majority of cases, is a consequence or extension of endometritis. According to Virchow, it commences as hyperæmia, which is characterized by tumefaction, redness, and softening of the muscular fibres of the uterus. This state necessarily involves an augmentation of the volume of the organ, and it also retards or arrests the process of involution. As the inflammation advances, pus is formed in the connective tissue, which is more or less destroyed by purulent invasion, while the adjacent muscular elements pass either into a state of fatty degeneration, or else into sloughing. Thus, small abscesses are formed, generally in isolated and limited portions of the uterine walls, but sometimes forming purulent collections of considerable size. Hervieux states that he has seen the whole uterus converted into a veritable purulent sponge.

Sloughing of the walls of the abscess sometimes occurs, so that the pus perforates through either of the uterine surfaces. A discharge into the cavity of the uterus is the more safe termination, and perforation into the peritoneal cavity the more dangerous, as it leads directly to peritonitis. Perforation sometimes takes place into the cavities of the adjacent viscera, which had previously become adherent to the uterus. In some cases, the muscular walls are found in a state of

putrescent softening, either in circumscribed points or involving the whole substance. The tissue, then, is not red or reddish, but of a greenish-gray or slate color. In these cases, the walls are not hypertrophied, but are flabby, thinner, and more yielding to pressure.

In severe epidemics, it is not very rare to meet with genuine gangrene of a portion of the uterus. This condition will be readily recognized by a black or livid portion, surrounded by a more or less unequal fringe of red, by the pulpy softness of the degenerated tissue, by the disorganized detritus, and by the peculiarly offensive odor of the gangrenous portion. The gangrene is almost always limited, and is oftener found in the cervix than in the body of the uterus. The mucous membrane is more frequently the seat of the gangrene than the walls, and it is probable that gangrenous endometritis is the original point of departure of parenchymatous gangrene.

Let us now briefly study the causes of puerperal metritis. If we recall the extraordinary modifications which the uterus undergoes during gestation, the wonderful development of its mucous and its muscular tissues, and, more especially, of its vascular apparatus during this period, the violence of the muscular contractions at the time of labor, and the compression and the lacerations which ensue, both in natural labor and in operations necessary to accomplish delivery, the rupture of vessels which takes place in the detachment of the placenta, and the more or less considerable loss of blood which results as a consequence, and the rapid change which takes place in the organ immediately after delivery, we shall not be surprised to find all the tissues of the uterus very susceptible to take on morbid processes. We are, then, prepared to accept as

causes of puerperal metritis: (1.) Imprudence, such as rising from bed prematurely, too long continuance in the erect position, too early resumption of family duties or of sexual intercourse—in fact, all these causes, which favor the gravitation of blood to the pelvis, induce congestion or provoke hemorrhage. (2.) Traumatic lesions, either of the cervix or of the vascular tissues of the placental seat, or, it may be, of the muscular walls of the uterus. (3.) Toxæmia, as uræmia, septicæmia, pyæmia, but, more frequently than all others, the special toxæmia of puerperal fever.

Now then, what are the symptoms which indicate that these causes have developed endometritis, parenchymatous metritis, or both? These diseases are so generally complicated with phlebitis, peritonitis, or with various blood-changes, especially in epidemics, that it is somewhat difficult to isolate the symptoms which belong to the metritis from those due to the other affections. But, in some epidemics, the metritis has been the most prominent characteristic lesion, and the symptoms in these epidemics have been so nearly identical with those where the disease has been demonstrated as arising from traumatic causes, that we can describe, with a good deal of confidence, those which belong to the metritis.

The first symptom which I shall mention is, pain in the uterus, resembling after-pains, but occurring in the primipara, or in multipara after the second day. These, if persistent, should receive serious attention. The pain differs in a very marked degree from the intense agony of peritonitis, but is usually dull and obscure, extending toward the inguinal regions and the loins, increased by movement, but not stamping the face with suffering, or eliciting from the patient groans of anguish,

as in peritonitis. Pressure over the fundus usually causes pain, but not always, as it is sometimes necessary to compress the sides of the uterus between the thumb and finger to determine the existence of morbid sensibility in this organ.

Increased volume of the uterus, as compared with its normal size for the time of the puerperal period, is a symptom never absent in metritis. This augmentation of size varies extremely. On the second day after delivery, it is sometimes found from three to six inches above the pubes; on the fifth or sixth day, from two to four inches, and this size is even observed in this disease from the fifteenth to the twenty-fifth day after delivery. It is thus evident that this increase of size is not merely due to arrest of involution, but to positive tumefaction of the tissues. It is readily ascertained to exist, both by abdominal palpation and by the vaginal touch. The fundus of the uterus may be found, by palpation, at any point between the pubes and the umbilicus. Owing to the enlargement of the body of the uterus, which prevents it from sinking into the pelvic cavity, the cervix is sometimes very high, so as to be beyond the reach of the finger in vaginal exploration. In the first days after delivery, the cervix is soft and patulous, and the closure of the os is often retarded by the metritis, and especially if there have been any considerable laceration of the cervix.

The next symptom to which I shall call your attention is the lochial discharge. Most authors speak of this discharge as being diminished or suppressed by metritis. It is true of some violent and acute attacks, that the lochia are suppressed. Nurses, and even physicians, are sometimes ready to assign this effect of disease as the cause of all the subsequent troubles. The

suppression is the effect of the metritis, but it is not to be forgotten that it may also induce very bad results through septic or purulent absorption. The return of the lochia, normal in character and quantity, is to be regarded as a favorable symptom. But, if the lochia be purulent. at an early period, we have strong reason for believing that we have to deal with a case of metritis, or, more emphatically, with endometritis. Our apprehensions are confirmed if the discharges have a marked fetid odor. A symptom of still greater gravity is, the continuance of the discharge of a sanguinolent character beyond the usual normal period; that is, beyond three or four days. If the discharge be still chiefly blood, after the first week of the puerperal period, or if it become markedly more sanguinolent, or if, after it has once notably diminished, there be a reappearance of any considerable loss of blood, we may be almost sure of the existence of endometritis or metritis, particularly if this reappearance be attended with febrile exacerbations and more or less severe pains in the region of the uterus. We are not to regard this as merely a drain on the system, which retards convalescence and postpones the cure of the patient, but as a symptom of grave significance. I have often spoken of this to my staff in this hospital, and have frequently referred to it in my clinical lectures; and I am therefore glad to see that Hervieux has given this symptom, which has heretofore been but slightly noticed by other writers, a very marked prominence.

Simple puerperal metritis is rarely ushered in with a chill, when it is uncomplicated, at the beginning, with either phlebitis or peritonitis. But there are usually some febrile symptoms, with a feeling of lassitude and depression. The pulse ranges from 90 to 100, the tem-

perature, in uncomplicated metritis, varies from 100° to 104°. Except over the uterine tumor, the abdomen is soft and yielding. The appetite is generally diminished, but not absolutely wanting, and there is neither nausea, vomiting, nor diarrhœa. If the metritis or endometritis have gone on to the suppurative stages, the symptoms are of a more grave character. We then may have slight recurrent chills, more marked febrile exacerbations, a quicker pulse, and a higher range of temperature. If the disease go on to putrescent softening or to gangrene, the prostration becomes extreme, the face pale, often bedewed with moisture, the pulse is quick and feeble, the extremities cold, the lips blue, the cheeks often of a dark scarlet color and the respiration hurried, while the lochial discharges are offensive beyond the power of language to describe.

When the metritis is complicated with peritonitis or phlebitis, we have the characteristic phenomena of these affections superadded, perhaps, to such an extent as to mask, in some degree, the symptoms indicative of metritis.

As regards the duration of puerperal metritis, violent and intense forms of it, in epidemics, go through its various stages of suppuration, putrescence, and gangrene in two or three days, allowing no time for the conservative efforts of Nature or for therapeutic resources. An acute but less severe form is often of much longer duration, but is attended with great danger. Suppuration commences early, and may be followed by putrescence or gangrene, or may develop lymphangeitis, phlebitis, or peritonitis; and, with such complications, we have great reason to expect a fatal result. But there is no doubt that a certain proportion of even such cases get well. We sometimes see a pneumonia, or a

pleurisy or a mammary abscess, supervene, and the metritis with its complication at once begins to subside.

I believe that a benign form of metritis occurs very frequently in puerperal women. While the local and physical signs of its existence are undoubted, there is an absence of the grave general symptoms, such as marked febrile exacerbations, a very quick pulse, high temperature, or total loss of appetite; and, at the end of a few days, the recovery is complete. But, if the metritis be overlooked or disregarded, there is a tendency to complication, particularly by the development of pelvic cellulitis, and thus convalescence may be retarded for several weeks. Every year I am called more or less in consultation to see cases of what are called "bad getting up." The patients are very slow in recovering their strength, the pulse is rather quick, the tongue is slightly coated, the appetite is capricious, and a careful history of the case, combined with a thorough physical exploration, leads me to the conclusion that they have had an attack of metritis which has developed cellulitis. Fortunately, a large majority of such cases terminate by resolution, but in some the cellulitis goes on to suppuration. Unfortunately, some cases of puerperal metritis pass into the condition which is generally termed "chronic metritis," but which my friend Professor Thomas prefers to call "areolar hyperplasia of the uterus."

Now comes the most important question of all, How shall this disease be treated? I shall try to give you my ideas on this point as clearly as possible. First, then, when the symptoms of metritis are manifest in a puerperal woman—that is, when I find the patient with pain in the hypogastrium, the uterus larger than it should be at the time of the puerperal period, and

painful on pressure, the lochia diminished in a marked degree or perhaps wholly arrested, or, on the other hand, a return or positive increase in the amount of blood lost in this discharge, with a quick pulse and more or less fever—I at once give the following powder, well mixed in a wineglass of sugar and water:

℞. "Tully's powder,"		
Potass. bicarb., āā	gr. x.	
Hydrarg. chlor. mit.,	gr. v.	M.

If the skin be very hot and dry and the pulse very hard, I may substitute the following:

℞. Pulv. potass. nitrat.,	gr. x.	
Pulv. gum-camphor.,		
Hydrarg. chlor. mit., āā	gr. v.	
Pulv. Jacobi veri,	gr. iij.	
Pulv. opii,	gr. j.	
Vel morphiæ sulph.,	gr. ¼.	M.

I anticipate the following effects from these powders: The pain will be relieved; nervous irritation allayed; sleep induced; fever subdued; diaphoresis promoted; and, eight or ten hours after, an easy, free, revulsive cathartic action will follow. Please observe that I give the calomel simply because its cathartic action is more free, easy, and painless, than any other. If the cathartic action do not follow in ten hours, I order whatever saline laxative can be the most easily taken by the patient.

I also direct that a turpentine-stupe shall be applied over the uterus, and kept on until the patient insists on its removal, when cotton-batting should be laid over the uterus, and this should be covered with oil-silk. If the patient complain of severe pain or of burning from the turpentine, the cotton may be wet with laudanum, which will soon comfort her. It is curious to observe,

as I often have, the apparently paradoxical results from the turpentine, that, if the lochia have been suppressed, the application is usually followed by their return, or, if they have been excessive and sanguinolent, the turpentine produces a palpable decrease in the amount of blood lost; but, I think, after a few moments' reflection, you will see the reason why the turpentine produces such apparently opposite results.

The pain is generally in a great measure overcome by the means that I have just mentioned. If the disease appear to be of a sthenic type, I have found great benefit from the application of six or eight wet cups over the uterus. I never make use of leeches in these cases, because of the inconvenience and danger from exposing the parts to cold during the uncertain period while the leeches are on, and while the subsequent bleeding continues. If, after two or three days, there be not an evident decrease of the uterine tumor, I have found positive improvement follow the application of a blister, great care being taken that strangury is not excited. In those cases where the uterus is very large and the pain has been subdued, while the lochial discharge is profuse and sanguineous, I very frequently, in private practice, write a prescription as follows:

℞. Ext. ergot. fld. (Squibb's),
Tinc. nucis vomicæ,
Tinc. ferri chloridi, } āā ℥ ss.
Glycerin.,
Syr. aurant. cort., āā ℥ j.

M. S. A teaspoonful in a wineglass of sugar-and-water, every fourth hour.

Generally within twenty-four hours, the influence of these medicines, in reducing the size of the uterus and in diminishing the hemorrhagic lochia, is very evident.

In this hospital, also, a similar prescription of mine has been much used, and I believe the staff have been decidedly convinced of its usefulness.

Throughout the whole treatment of puerperal metritis, I regard vaginal injections as absolutely essential. Formerly, I used for this purpose warm water impregnated with Labarraque's solution of chloride of soda, as strong as the patient could bear without smarting. Recently, I have generally used the carbolic acid, as in the following formula:

℞. Acid. carbol. glacial.,
Glycerin., āā ℥ j.
Aq. puræ, ℥ vij.
M. S. A tablespoonful in a tumblerful of warm water.

If the lochial discharge be very purulent, and particularly if the odor be offensive, the injections should be used four, five, or six times a day, great care being taken to instruct the nurse how to use them without annoying or fatiguing the patient. If the discharges be positively fetid, we must not rely on vaginal injections, but must resort to their use within the cavity of the uterus. It is my belief that intra-uterine injections should be administered with the greatest care, and always by the physician himself. They have been condemned by some very eminent authorities, and quite a number of deaths have been published as resulting from their use. I am quite convinced that the death of two patients, whom I visited once each, in the month of March in the present year, was directly the result of intra-uterine injections; and a physician of decided prominence in this city has told me that he has lost two patients, as he believed, from the same cause. Thus I must admit that four cases of death from this cause in this city have come to my knowledge. But, on careful inquiry, I am

satisfied that the fatality was not, in either of these cases, a necessary result of what may be termed a washing out of the cavity of the uterus with an antiseptic fluid, but was entirely due to the mode in which these intra-uterine injections were made. I have never used and shall never advise the use of a syringe for this purpose, in puerperal metritis, for I think it is impossible with a syringe to exactly measure the force with which the fluid passes into the cavity of the uterus. The danger seems to arise from the entrance of air into a vein, as in some cases where the death has been sudden, or, in other cases, from the passage of the fluid into the Fallopian tubes, and peritonitis or phlebitis has ensued. I think, therefore, for intra-uterine injections, either Scanzoni's irrigator, or the French irrigator, or the "fountain syringe" (which is not a syringe at all) should be used, as we can thus exactly adjust the force with which the fluid enters the uterine cavity. Another point of great importance is, that the fluid injected should easily and rapidly flow back again out of the uterus. Therefore, the canula for carrying the fluid into the cavity should have a double canal, like the one which I now show you, made for me by the direction of Dr. Robert T. Newman, of this city, or the very ingenious canula of Dr. Byrne, of Brooklyn. These canulas are easily connected, by a piece of India-rubber tubing, with whatever irrigator you may choose to employ. By such precautions as these, I think intra-uterine injections may be made with perfect safety, and I am absolutely certain of their great usefulness. Let me again refer to the necessity of ascertaining that the liquid flows freely back, either through the free canal of the canula or from the vagina, otherwise the cavity may be over-distended, and some of the evils to which I have referred may follow.

M. Hervieux affirms that he has often observed, after each intra-uterine injection, a marked decrease in the size of the uterus, in some instances, from two to two and a half inches in forty-eight, and even in twenty-four hours, in cases of metritis, where it had before for a long time remained stationary, and that he almost constantly has noticed, as a result, a progressive subsidence of the fever, the pulse falling from 112, sometimes 120, down to 104, 96, 92, and 84. I have never had the good fortune to mark such striking changes as these in so short a period, but I have frequently seen this disinfection of the lochia followed by a very marked improvement in the general symptoms, such as the disappearance of the abdominal pains, the return of the appetite, and the gradual fall of temperature and decrease in frequency of the pulse.

I think that I have omitted to remark, that, during the whole treatment of this disease, opiates should be given, when necessary, to relieve pain or secure sleep. But, unless the metritis be complicated with peritonitis, a very moderate dose given at bedtime will generally be found sufficient for this purpose, and I am very much in the habit of giving the opiate in the form of a rectal suppository—as, for example, one grain of the aqueous extract of opium with three grains of butter of cacao—because I wish to reserve the stomach for the absorption of other medicines, stimulants, and food.

In the suppurative and putrescent stages of puerperal metritis, our main reliance in connection with the intra-uterine injections must be on quinine and alcohol. Instead of giving the quinine in two or three-grain doses, at intervals of three or four hours, as I formerly did, I think that I now much more effectively secure the anti-pyretic and anti-pyogenic effects of this remedy,

by giving a full dose twice a day; as, for example, from five to ten grains in the morning, and from ten to fifteen in the evening. Either whiskey or brandy should be administered as freely as the patient can take it without any unpleasant effects. I have often seen patients, with the symptoms that I have mentioned as belonging to the suppurative and even the commencement of the putrescent stage of puerperal metritis, bridged over, as it were, a very dangerous point of a few days, by means of uterine injections, quinine and alcohol, and they have eventually recovered.

LECTURE XVI.

PUERPERAL PERITONITIS.

Case—Puerperal peritonitis formerly regarded by many as synonymous with puerperal fever—Very frequently secondary to phlebitis, endometritis, or some other suppurative phlegmasia in the pelvic tissues—Sometimes a primary affection, and general from the beginning—In other cases, becomes general by contiguous extension—Most liable to occur early in the puerperal period—Sometimes developed before or during labor—Causes—Symptoms—Progress and duration—Time when death occurs—Modes by which recovery takes place—Diagnosis—Treatment—Opiates—Veratrum viride—External application of the oil of turpentine—Blisters—Quinine—Alcoholic stimulants—Vaginal injections—Nutrition—Absolute rest—Purgatives dangerous—Mercurials (?)—Venesection (?)—Report of a case appended.

"CASE XXVII.[1]—Annie N——, born in England, age twenty-nine, married, was delivered of her third child, February 1st, midnight, after a short labor of two and a half hours, vertex-presentation, and L. O. A. position. Boy, weight 8¾ lbs.

"*February 2d.*—10 A. M., respiration 20; pulse 68; temperature 97.5°.

"*February 3d.*—10 A. M., respiration 18; pulse 74; temperature 98.5°.

"*February 4th.*—10 A. M., respiration 20; pulse 84; temperature 99°. 4 P. M., respiration 28; pulse 116; temperature 101.5°.

"The patient, a few hours before, had got out of bed and gone with bare feet to the water-closet. Soon after her return to bed, she had a severe chill which lasted a half-hour. She then complained of severe pain in the abdomen, most severe at the umbilicus. Some tympanites, and great sensitiveness to pressure. Ten drops

[1] Reported by Richard C. Van Wyck, M. D., house-physician to Bellevue Hospital.

of Magendie's solution of morphia, and turpentine-stupes to the abdomen, were ordered.

"10 P. M., respiration 24; pulse 120; temperature 104°. Pains more severe and increase of tympanites. The same dose of morphia to be given every hour until the pains are relieved.

"*February 5th.*—9 A. M., respiration 24; pulse 116; temperature 102°. 2 P. M., respiration 24; pulse 124; temperature 103°. 10 P. M., respiration 28; pulse 132; temperature 103°. She took, during the night, thirty drops of the morphia. The pain is much less severe, but the abdomen is very sensitive to pressure and extremely tympanitic. In the morning, she vomited several times a dark, greenish fluid. In the evening, bowels moved four times. Lochia very profuse, purulent, but without much odor. Eyes sunken and surrounded with a dark areola. Surface clammy. Delirious. Warm injections with carbolic acid.

"*February 6th.*—9 A. M., respiration 24; pulse 112; temperature 102°. 2 P. M., respiration 24; pulse 116; temperature 103.5°. 9 P. M., respiration 20; pulse 132; temperature 103.5°. Diarrhœa continues. Patient does not complain of pain, except when the bowels move. Bismuth. subcarb. gr. x, after every dejection. Ten drops of morphia, hypodermically, p. r. n.

"*February 7th.*—9 A. M., respiration 28; pulse 136; temperature 102.5°. 2 P. M., respiration 32; pulse 148; temperature 104°. 10 P. M., respiration 20; pulse 152; temperature 103°. Patient died at 4 A. M., February 8th.

"*Autopsy, eleven hours after death.*—On opening the abdomen, the intestines were seen distended with gas. The peritoneal cavity contained a large quantity of sero-purulent fluid, with lymphy flocculi. The intestines were in some parts agglutinated with what appeared to be new adhesions. The lower border of the liver and the spleen were more or less covered with patches of false membrane. The peritonæum was thickened in various points, and injected with numerous arborizations. The uterus was six and a half inches in length, four and a half in breadth. Its walls seemed to be perfectly healthy. Incised in every direction, no pus could be detected anywhere, either in its parenchyma or its sinuses. Its internal coat was covered with a dirty-reddish coating, which was not fetid and was easily washed off. The Fallopian tubes, ovaries, and broad ligaments were entirely healthy. The liver was somewhat enlarged and fatty. All the other abdominal and the thoracic organs were normal."

Gentlemen: Peritonitis, general or partial, is one of the most common, as it is one of the most serious, of the puerperal diseases that we have to encounter. As I was out of town, I did not see this patient, until the day before her death; but, from the history of the case and the results of the autopsy, I regard it as one somewhat exceptional in my experience. The peculiarity of the case consists in the fact that it was general and primary; that is, it was not consecutive to any other local inflammation or propagated by continuity from the pelvic cavity, nor was it a secondary lesion of puerperal fever. It is so frequent and striking a lesion of certain epidemics, that, by some authors, not many years ago, puerperal peritonitis was used as a term synonymous with puerperal fever. The tendency of the doctrine of the day is to regard puerperal fever as a traumatic fever; and those who accept this view believe that peritonitis is generally secondary to inflammation of the other organs and tissues in the pelvic cavity.

It is true that, in a majority of cases, we find peritonitis either coincident with, or a consequent of an endometritis, a metrophlebitis, a pelvic cellulitis, or a suppurative inflammation of the broad ligaments or of the ovaries; but, in the patient whose history you have just heard, it was not associated with either of these lesions.

As a general proposition, it may be stated that peritonitis, in the puerperal woman, is sometimes a primary affection, and is general at the onset; or it becomes general, by contiguous extension from the starting-point, which is most frequently that portion of the serous membrane which covers the uterus, or is adjacent to it; although, in more rare cases, it seems to commence at the hypochondrium or the umbilicus.

Thus we meet with cases where, from the commencement of the attack, the whole peritonæum seems equally involved, and the pain and tenderness are no greater at one point than another, being the same at the epigastric, the hypochondriac, or the umbilical region, as in the iliac fossa or over the uterine tumor; and the autopsical lesions are found to be no more intense or farther advanced in one part than in another.

This form of general peritonitis sometimes occurs sporadically in private practice, and in the country, but it is more frequently met with in cities and in hospital practice, and it is specially characteristic of certain epidemics.

It also occurs uncomplicated with any other lesion, as in the present case, in which no pathological modification was found, either in the uterus or its appendages; but in my experience this is quite a rare event. My own observations are entirely in accord with the statement of Hervieux, that there are cases of general puerperal peritonitis, independent of any pathological alteration of the uterus or its appendages, in the same manner as we meet with cases of uterine phlebitis, with or without purulent infection, and without the slightest trace of peritonitis.

While, then, it is undoubtedly true that general peritonitis does occur as a primary affection from the onset, the evidence furnished by the clinical history and the autopsical lesions seems conclusive that, in a majority of cases, the inflammation commences in the pelvic cavity and becomes general by propagation from contiguity, and also that it is generally associated with, and perhaps is secondary to, lesions of the uterus, or of the ovaries, or of the Fallopian tubes. I think that all who have had a large experience in the study of

this disease will concur with the statement of Hervieux, that, in a majority of women who die from puerperal peritonitis, the autopsy reveals either metritis, uterine phlebitis, abscesses in the uterus, putrescence or, it may be, true gangrene of the uterine tissue, or else phlegmon of the broad ligaments, suppurative inflammation of the Fallopian tubes, or suppurative or hemorrhagic ovaritis.

In a large majority of cases, this disease attacks puerperal women during the first three days after confinement. Thus, Hervieux states that in 247 cases observed at the *Maternité*, Paris, by Berrier-Fontaine, the attack occurred from the first to the third day in 185, from the fourth to the tenth, in 60, and in two, on the eleventh and twelfth days. In 87 cases observed at this same hospital, by Tarnier, the invasion of the disease took place—

Immediately or very shortly after delivery in	21
One day after delivery	27
Two days after delivery	20
Three days after delivery	11
Four " " "	4
Five " " "	1
Eight " " "	3

After the eighth or tenth day, it is very rare that a woman is attacked with this disease, except when it occurs as a consequence of imprudence or errors of diet, or when the disease is consecutive to some other pelvic phlegmasia, as a metritis, or a phlegmon of the broad ligaments, or a pelvic cellulitis.

You observe that, in twenty-one of these cases, the attack came on immediately or very shortly after delivery. This has been the fact in quite a number of cases that have come under my observation, in private as well

as in hospital practice. Indeed, I may say that, in several instances, the patient has exhibited for a short period, just before and during labor, such symptoms that the attack was not a surprise to me. A few days before labor, there have been, perhaps, slight febrile exacerbations, with a quick pulse, thirst and loss of appetite, soreness and tenderness over the uterine tumor, and, in some cases, marked symptoms of cystitis, which I regard as very ominous. When labor has come on, the pulse has been quick throughout the whole labor, the pain has been disproportionate to the force of the uterine contractions, and the patient has been very intolerant of pressure over the uterus, and especially to the application of the binder after delivery. In several cases that I have seen in consultation with medical friends, and particularly in a very severe case that I saw with my friend, Dr. Trask, of Astoria, I was strongly impressed by the mention of more or less of these symptoms as having been present antecedent to or during labor. So that now, whenever I find that such symptoms have existed or are manifested during labor, my fear of peritonitis is so great that, immediately after delivery, I put my patient under the full influence of an opiate, which I continue until all grounds for apprehension have been removed.

The progressive expansion of the gravid uterus and its invasion in the abdominal cavity, with the consequent unusual pressure on the tissues within the cavity, cause, in many women, chills, spasms of pain, and other disturbances, and undoubtedly, in some instances, predispose the peritoneal membrane to take on morbid action. So, also, the violence done to the uterus and its appendages by parturition frequently induces local inflammations, which are propagated by contiguity

to that portion of the membrane which covers these organs, and thus consecutively induce inflammation of the whole peritonæum. But these modifications are physiological in most women, and become pathological in a very few. Other elements are therefore necessary to develop morbid action.

It has long been settled by the best pathologists, that peritonitis is rarely a spontaneous and primitive disease. As I have before remarked, in puerperal women, it is generally associated with some inflammation, either of the uterus, the ovaries, the Fallopian tubes, or the broad ligaments, or some suppuration that explains the peritoneal inflammation, which is at first circumscribed, but gradually involves the whole serous membrane. But there are exceptions to this rule, and the case, the history of which you have just heard, is an example. These exceptions are sufficiently numerous to establish the fact that puerperal peritonitis may occur independently of any lesion of contiguous organs, just as we meet with pleurisy, pericarditis, or meningitis, as primary lesions.

I have no doubt that exposure to cold may develop puerperal peritonitis. I suppose that every year my house-physician has given me a similar history to that of the present case, in which the attack seems attributable solely to this cause. The patients have got out of bed and gone with bare feet on the cold floor to the water-closet. Explicit orders and warnings of danger seem to have but little influence with our patients in preventing this accident.

In private practice, I have seen but one case where exposure to cold could with certainty be ascribed as the cause of puerperal peritonitis. Monthly nurses are generally much more careful in guarding their patients

from exposure to cold than in protecting them against bad ventilation and impure air. The patient I alluded to was in excellent health during gestation, and was delivered of her sixth child after a perfectly normal labor of five and a half hours. On the following morning, twenty-six hours after the labor, I found her in a most satisfactory condition in every particular. It was a very warm day in September, and she was much annoyed by profuse perspiration. She was an imperious woman, of great force of character, and two hours after my visit she insisted that her nurse should sponge her all over with cold water, during which process she was entirely uncovered, with the exception of her lochial guard. The sponging was hardly finished, when she was seized with a violent chill of some minutes' duration. She would not consent to have me sent for until some hours after, when I found her lying on her back, with her knees drawn up, breathing rapidly, suffering from intense pain in the abdomen, which was enormously distended and exquisitely sensitive to the slightest touch; and the lochial discharge, which with her was always very free, was entirely arrested. For several days she was extremely ill, but she eventually recovered.

In puerperal women, as in the non-puerperal, and in men, peritonitis is incidental to certain blood-changes, as in the renal diseases which induce albuminuria or uræmia, in erysipelas, in pyæmia or in septicæmia. But undoubtedly by far the most frequent of all the causes of puerperal peritonitis is the special toxæmia of puerperal fever, and, in connection with that subject, I shall again have occasion to call your attention to certain peculiar features of the disease.

I shall not detain you by a discussion of the pathological anatomy of puerperal peritonitis, for I think

that I can more profitably refer you to the work of Klob, on the "Pathological Anatomy of the Female Sexual Organs," or the excellent little "Hand-Book of Post-mortem Examinations and of Morbid Anatomy," by Dr. Francis Delafield, with the contents of which you should all be thoroughly familiar.

We have now to study the symptoms which clinically characterize general peritonitis. I have before remarked that, when the disease is primary, in a majority of cases, it attacks puerperal women, during the first three days after delivery. But, when it is secondary to endometritis, uterine phlebitis, or suppurative inflammation of any of the tissues within the pelvic cavity, or when induced by imprudence of any kind, it may be developed at any time during the puerperal period. The symptoms, therefore, will vary according to the mode and the period of the attack, and the epidemic type of the season.

In general terms, it may be said that this disease is ushered in by a chill, accompanied with or followed by pain, either limited to certain parts or extending over the whole abdomen, a frequent, sharp, or hard pulse, a rise of temperature, gradual or rapid enlargement of the abdomen, increased frequency of respiration, loss of appetite, vomiting, constipation or diarrhœa, and subsequently troubles of innervation, as exhibited by the facial expression, by feebleness and prostration, with headache, and sometimes delirium and coma. After this rapid exposition of the general symptoms of the disease, let us now study them more in detail.

I do not remember that I have ever seen a case which was not ushered in by a chill. This is sometimes so violent as to cause the teeth to chatter and the whole body to be shaken with trembling, while the

countenance is anxious and pinched, and the patient demands with great earnestness additional clothing. In other cases, it is only a slight shivering or a passing sensation of cold, which the patient attributes to a draft of air, an open door, or insufficient covering. The duration of the chill is generally proportionate to its intensity, lasting, in the slightest, but a minute or two, and continuing, in the very severe, perhaps an hour or more.

Some writers assert that puerperal peritonitis is characterized by a single chill. This is true in many cases, particularly in the very acute, and in some sporadic primitive cases, but it would not be safe to base a diagnosis on this assertion. For the truth is that, when the inflammation commences at any one point of the abdomen and progressively invades different parts of the peritonæum, each successive step in the disease is often announced by a recurrence of the chill. So also, when the peritonitis is secondary to an endometritis, a suppurative inflammation of the broad ligament or of an ovary, as each tissue is attacked by the inflammation, there is generally a return of the chill.

The pain in the abdomen rarely occurs before the chill, but is manifested with it or speedily follows it, and is generally very severe. In many cases, it is first complained of in the umbilical region or one of the iliac fossæ, and extends rapidly to the hypogastrium, to the lumbar region, the epigastrium, and both the hypochondria. In primary general peritonitis, the pain does not thus attack successively different parts of the abdomen, but the patient complains of atrocious agony, which she localizes sometimes in one part and sometimes in another, but the whole of the abdominal walls are exquisitely sensitive, so that the slightest palpation is intolerable, and even the weight of the

bedclothes cannot be borne. The patient consequently lies fixed and immovable, avoiding the slightest movement of any part of the body, and the respiratory action is wholly thoracic. Most writers describe the position of patients in this disease as being dorsal, with the knees drawn up, but I have seen many cases in which the patient lies with the legs extended. Both the position and the countenance are most significantly expressive of anxiety and intense suffering. The very severe pain usually continues but one or two days. At a later period, there only remains great sensitiveness to pressure in limited points, and this often disappears when the abdomen has become excessively tympanitic. The pain seems to subside as the sero-fibrinous exudation takes place, and it generally is entirely absent after the exudation has become purulent.

The symptom next in importance is the accelerated pulse. This persists, with but slight remissions and exacerbations, from the commencement to the end of the disease. It is a constant measure of the intensity of the inflammation, increasing or diminishing in frequency as the disease progresses or retrogrades. During the chill, the pulse, while increased in frequency, is often compressible and feeble, but, as a rule, in general peritonitis, after the chill has passed off, the pulse remains full, strong, and hard, sometimes until the patient is moribund. But, generally, as the fatal period approaches, it becomes feeble, thread-like, and now and then imperceptible. In most cases, the pulse is found more frequent, by from six to ten beats, in the evening than in the morning.

A rise of temperature, as shown by the thermometer, is a constant symptom in this disease. Even during a chill, when the patient was urgently demanding

more covering, and the hands and feet were cold, I have seen the thermometer mark 104.5°, and, after the chill passed off, the temperature fell to 103°. During the progress of the disease, the temperature remains constantly high, ranging, in different cases, from 101° to 104°, according to the intensity of the inflammation. There is a positive relation between the frequency of the pulse and the temperature, but this is not fixed or constant. I have several times observed an increased frequency of the pulse in the evening as compared with the morning, while the temperature has remained the same, or even fallen a degree or more. So, on the other hand, I have often seen the temperature remain high, while the pulse has been gradually reduced in frequency by the use of the veratrum viride, down to 80, or even a lower number.

The tongue sometimes remains moist and without coating throughout the whole course of the disease. Generally, it is at first moist but slightly whitened, gradually becoming covered with a moderately thick white or yellowish coat, and it is frequently sticky and flabby, showing the indentations of the teeth. Then it gradually becomes dry, and the coating, brown and shriveled. In some cases, the teeth are covered with sordes; viscous, tenacious mucosities interpose between the tongue and the roof of the mouth, rendering articulation painful and difficult, and this condition is attended with an urgent and incessant thirst. In some, the white coat disappears at an early period, and the tongue remains red.

Generally, the appetite is entirely wanting, but, occasionally, we see patients who complain of hunger as the disease approaches a fatal termination. During my present term of service, one patient called for and par-

took of more milk and beef-tea in the six hours previous to her death than she had taken altogether in the five days of her illness.

In many cases, the stomach is disturbed at an early period, and nausea and vomiting continue at intervals during the whole course of the disease, or until the patient is convalescent. At first, the matter thrown off is merely the contents of the stomach mixed with mucus, afterward bilious matter, and finally green, brown, and black, or, as it has been termed, "coffee-ground," fluids are ejected. Vomiting is not a constant phenomenon in this disease. Where peritonitis results as a lesion of puerperal fever, this symptom is seldom absent, but, in cases of moderate intensity, and when it is secondary to other pelvic inflammations, it sometimes does not occur even when the disease has a fatal termination. The vomiting sometimes suddenly ceases, either spontaneously, or, as the result of treatment, and is immediately followed by diarrhœa, and so, in some, if the diarrhœa be arrested, the vomiting returns.

In puerperal peritonitis, diarrhœa is much more frequent than constipation, and it is sometimes so excessive as essentially to contribute to the fatal result. Hervieux, much more emphatically than any other author, has signalized the excessive predominance of bile in the evacuations, both from the vomiting and the diarrhœa, as peculiar and characteristic of puerperal peritonitis, and my own observations are quite in accord with his. A moderate diarrhœa often seems to be followed by an improvement in the condition of the patient.

One of the most constant and one of the most characteristic symptoms of general puerperal peritonitis is abdominal tympanites, which begins to appear soon after the chill and the pain. It sometimes becomes so

great as to make the abdomen more prominent than before delivery, and the pressure on the diaphragm from this cause may diminish the capacity of the chest, and seriously impede respiration and the action of the heart. As a rule, we may say that the severity of the tympanites is proportionate to the intensity of the peritonitis; but it is not always so, for I have seen excessive tympanites in cases of moderate intensity.

A more frequent respiration, as I have already remarked, is a necessary result of the abdominal tympanites, and this, therefore, you must remember as one of the characteristic symptoms of puerperal peritonitis. You will find your patient breathing from twenty-four to forty or fifty times a minute. You will observe that there is always a comparative, although not a definite and fixed relation, between the respiration, pulse, and temperature. The more frequent the respiration, the more rapid the pulse and the higher the temperature. When an exception occurs, it generally can be easily explained by some peculiar phenomenon in the case; as, for example, latent pleurisy, which is not a rare complication, may cause the respiration to be as frequent as fifty or sixty a minute, while the pulse is not above 112–120, and the temperature 102°–103°.

Headache, although not very severe, is generally complained of at the time of the chill or soon after, but this usually disappears after a day or two. A moderate degree of delirium in the later periods of general peritonitis is manifested in a majority of cases. Prostration of the vital forces and of the muscular powers supervenes at an early period. The patient lies in a fixed position, apparently indisposed to make the least effort of the will or to move. There is extreme lassitude, with a corresponding intellectual feebleness.

The voice is weak and tremulous, and the articulation is often indistinct. Morally, there is an apparent torpor and indifference to every thing going on, but nurses and friends in attendance often greatly err in supposing that there is real apathy. I have sometimes thought that this appearance masked increased vividness of sensibility, for I have seen slight moral disturbances, in connection with the nurse, the child, or other members of the family, cause great agitation, resulting in a quickening of the pulse, a rise of temperature, a renewal of abdominal pain, and an increase of the tympanites.

During the time of the chill and the period of severe pain which follows, the countenance, as I have before remarked, is very expressive of pain and suffering. After this time, the eyes become sunken and surrounded by a dark areola, the nose pinched, the cheeks hollow, and often with a crimson hue, while the general color is darker. Writers have described the countenance as losing all expression, or as dull and stupid; but to my eye the expression which patients generally wear in the advanced stages of general puerperal peritonitis is rather that of absent, dreamy reverie.

The lochia furnish no indication by which we can judge of the severity of the disease. They are sometimes diminished or suppressed, while, in other cases, they continue without any marked modification through the whole period of the disease. They frequently are very much diminished during the chill, but are reëstablished when reaction takes place. Ordinarily they diminish in proportion as the disease approaches a fatal termination. When excessive, purulent, or fetid, we may infer that the peritonitis is complicated with uterine lesions.

As regards the mammary secretion, it is ordinarily very much diminished at the onset of the disease,

and sometimes entirely disappears. In other cases, it returns even while the disease is progressing, and, again, I have known it to be arrested during the disease and to return after recovery.

The progress and duration of peritonitis vary greatly in different cases. In some, the disease is general from the beginning. In other cases, it becomes general by successive steps, commencing in some one point, most frequently in one or the other of the iliac fossæ, or in the pelvic cavity. Death may take place, in severe cases, in from two to six days. In other cases, the disease commences with intense violence, but apparently becomes less severe on the second or third day, although steadily going on to a fatal result. In some, the patient seems to resist the disease for so long a time as to lead to delusive hopes of recovery, unless there be a careful recognition of the condition of the abdomen, the tympanites, the temperature, the feebleness of the pulse, and the diarrhœa. Often, in such cases, death does not occur until two or three weeks from the beginning of the attack. So, also, there is equal variety in the mode of recovery. In some, the attack is most sharp and violent, but seems to be aborted, and terminates, apparently, as suddenly, in two or three days, leaving behind but slight traces of its effects. In a majority of cases, even when peritonitis is the prominent lesion of puerperal fever, if the disease apparently abate the day following the attack, it subsequently reappears, rarely with its primary violence, but with increasing gravity, until it reaches its acme, and then gradually subsides.

Peritonitis terminates by recovery in a variety of ways. The disease, which was general in the beginning, sometimes gradually localizes, or becomes circumscribed

in one or more points, as in the hypogastrium, or in one or the other iliac fossa, and a favorable termination results in one of several different modes.

When the patient has been previously in good health, and her convalescence is not retarded by epidemic influences, the localized exudation may be rapidly absorbed, and the patient recover her health in a few days, and, by the end of the puerperal period, she may be as well as if the disease had not occurred. But, in many cases, the localized exudation becomes indurated and forms a circumscribed tumor, painful on pressure, while the adjacent tissues are not sensitive. The tongue remains white, the pulse quick, 100 or more, the temperature continues two or three degrees above the normal standard, the appetite remains delicate and capricious, generally, there is neither nausea nor vomiting, but usually constipation; and this condition sometimes lasts for weeks, and then finally disappears, and the patient gradually regains her health.

In a smaller number of cases, the localized peritonitis terminates in a purulent collection, which is almost always signalized by chills, (which are often recurrent,) hectic fever, night-sweats, total loss of appetite, and either constipation or diarrhœa. The pus is encysted by false membranes; and fluctuation, which is at first obscure, gradually becomes distinct. When this takes place, as the pain is much less, notwithstanding the hectic fever and the cachexia, patients usually express themselves as feeling better. The purulent collection finds exit, in some cases, externally, as in the groin, or near the umbilicus, or between the umbilicus and the crest of the ilium. If the discharge of pus take place internally, the intestines are the most favorable channel for its exit. But many cases have been reported in which

the pus has been discharged into the bladder, the vagina, or the uterus. Recovery, in some of these cases, requires weeks or even months. The purulent discharge by the intestines, as well as by the other internal channels, may take place so slowly and so imperfectly that the patients die from the purulent cachexia and hectic fever. When the discharge of pus takes place by the intestines, I have known it to continue for months, and even for years, the patient ultimately recovering.

Another mode of recovery from general puerperal peritonitis is that by which it seems to be supplanted by some other disease, as an erysipelas, a pleurisy, a pneumonia, a bronchitis, an abscess in the breast, or suppuration in one or more joints. Convalescence, in such cases, is very slow, sometimes requiring several weeks.

In describing the symptoms of general peritonitis, I have already given you the elements on which the diagnosis is based. I have told you that the prominent characteristic symptoms are the chills, abdominal pain, tenderness, and tympanites, quick pulse, a constant temperature from 3° to 6° above the normal standard, vomiting, either diarrhœa or constipation, and great depression of the vital forces. No one of these symptoms can be regarded as pathognomonic. Their diagnostic value consists in their combination. Many of them are common to other diseases, and some of the most characteristic of them are frequently absent in the general peritonitis of certain epidemics of puerperal fever. For example, the tympanites has been very prominent in certain cases of puerperal fever, in which the autopsy has revealed phlebitis, endometritis or suppurative inflammation of some tissue in the pelvic cavity, but not the slightest trace of peritonitis in any part of the pelvic or abdominal

cavity. Again, in some very rare cases, where the autopsy has demonstrated the existence of intense peritonitis, the abdomen has remained flat, without pain or marked sensitiveness, throughout the whole course of the disease.

Now, then, in what other disease do we meet more or less of these symptoms, which might lead us to mistake it for general puerperal peritonitis? When this disease is epidemic, some cases of after-pains, it is said, are liable to be mistaken for it. But these pains are paroxysmal; they are accompanied by perceptible contractions of the uterus; they are not ushered in by a chill; the pulse is not steadily increased in frequency; there is no marked variation from the normal temperature; these pains do not usually continue after the third day; the tenderness on pressure, except during the time of pain, steadily decreases, while, in peritonitis, it rapidly increases.

In several instances, I have known puerperal peritonitis to be suspected, where the symptoms were due to retention of urine. One of the best men whom I have had serve with me as house-physician in this hospital called my attention to a case of supposed puerperal peritonitis, when it was epidemic in the hospital. The patient had a chill, about sixty hours after the termination of labor. The pulse was constantly above 100, the temperature, 101°, the abdomen, enlarged and tender, with constant pain; there was a good deal of headache and some wandering, no appetite, but considerable thirst. Observing an ovoid, slightly-elastic tumor above the pubes, which was no more sensitive to pressure than the adjacent abdominal walls, I made minute inquiry in regard to urination. The physician and the nurse declared that she passed water frequent-

ly and easily, both during and since labor, and the patient herself asserted that she had no difficulty in doing so. I asked my friend to pass a catheter, and nearly two quarts of water were drawn off, and all the symptoms of peritonitis disappeared. While the water was flowing, I observed a high color in the face of my young friend, who thanked me for the "kind way" in which I had pointed out his error, expressing his conviction that I would not again catch him making that mistake.

Intestinal irritation sometimes assumes certain of the features of puerperal peritonitis; such as a coated tongue, nausea and vomiting, constipation or diarrhœa, and tympanites. But the abdominal pain and tenderness are not so severe, and are not ushered in by a chill, or followed by the constitutional disturbance, as shown by the pulse, temperature, and depression of the vital forces, which attend puerperal peritonitis.

I think it hardly possible to mistake a metritis, a phlebitis, or a suppurative inflammation, either of the broad ligament or of an ovary, for general peritonitis, unless it be complicated with one or the other of these diseases. One or all of them may be overlooked, but either, without complication, could not easily be mistaken for peritonitis.

We now come to the most important part of our subject; that is, the treatment of this disease. It would, perhaps, be very interesting to review the treatment of the past, and also to discuss the various methods of treatment which now receive the sanction of high authorities in different parts of the world. But we have not the time for this, and I must, therefore, limit myself to the duty of pointing out to you the treatment in which I believe.

(1.) The most important of all agents in controlling and in arresting this disease is opium in some form. Let us see what we gain by its use. The peristaltic movements are retarded or arrested, and thus the inflamed tissues have absolute rest; pain is annulled; emotional excitement is allayed; the nervous system is tranquillized; sleep is secured; and thus the depression of the vital forces, resulting from the shock of the attack, is lessened. The opiate, therefore, should be given in such doses as to secure all this. The amount required is to be measured only by the effect produced; and you will find the system, when peritonitis exists, extraordinarily tolerant of opiates. They should be given, and their influence steadily kept up to a point approaching semi-narcotism, as shown by the slow respiration and the somnolency, but it is never necessary to carry narcotism to the point of danger. Fortunately, in some cases, this seems almost impossible; but the patient should be carefully watched, and care should be taken that the respirations do not fall below 12 or 15 a minute, that the pupils are not much contracted, and that somnolency is not induced to a degree from which it is difficult to rouse the patient. The opiate should be steadily kept up to the point of tolerance, as long as there remains the least trace of the disease. I wish especially to emphasize this last remark, for very many times I have seen relapses occur, and the inflammation take a new start, from the suspension of the opiate, under the delusive belief that the disease has been conquered. Very often I have found it necessary to continue the opiate for some days or even a week or two after the abdominal pain, tenderness, and tympanites had disappeared, because the appetite did not return, the pulse remained quick and the temperature high.

The tolerance of the agent diminishes as the disease recedes. This you will find an infallible guide as to the measure in which you can reduce the quantity and diminish the frequency of your doses.

To enter more into detail, I would say, begin by giving your patient ten drops of Magendie's solution of morphia (morphiæ sulph. gr. xvj, aq. ℥j) every hour. If the effect sought for be not manifested after two or three doses, increase, by two or three drops, every third dose, until the desired impression be made. If the drops be rejected by vomiting, administer the morphia hypodermically. The solution, in the same proportion, should be freshly made, without acid, every second day, and thus the danger of local abscess where the needle of the syringe is inserted is avoided. After one or two hypodermic injections, the drops can usually be again tolerated by the stomach, which is preferable, because hypodermic injections almost invariably cause some emotional excitement and nervous disturbance, which are to be avoided if possible.

While I believe the tolerance of opiates to be very remarkable in this disease, without exceptions, yet, in different patients, this tolerance varies exceedingly. The quantity which some patients bear and seem absolutely to require, in order to control this disease, would appear incredible to those who have not had experience in its use. In a case treated by Professor Alonzo Clark, "the patient, who was unaccustomed to the use of opium in health, and who was not intemperate, took, the first twenty-six hours, of opium and sulphate of morphia, a quantity equivalent to 106 grains of opium; in the second twenty-four hours, she took 472 grains, on the third day, 236 grains, on the fourth day, 120 grains, on the fifth day, 54 grains, on the sixth day, 22 grains, and on

the seventh, 8 grains."[1] In a patient, whom I repeatedly saw in consultation with Dr. Howard Pinkney, the quantity daily administered, either by the mouth or hypodermically, was nearly as great, while it was found necessary to continue this enormous quantity for a much longer period, before convalescence was established.[2] But these are exceptional cases, for, ordinarily, the effects are produced by doses much less than those I have just mentioned.

In this hospital, for more than twenty years, the opiate-treatment, as I have described it, has been chiefly relied upon in peritonitis. To Professor Alonzo Clark, of this hospital, belongs the credit of introducing it, and of establishing the fact of the remarkable tolerance of opiates in general puerperal peritonitis, and of the necessity of pushing it to the point of tolerance, in order to secure the curative effects of the remedy. The use of large doses of opium in the treatment of peritonitis had been advocated previously by some distinguished men, as by Armstrong, Sir Thomas Watson, Bates, of Sudbury, and by Graves and Stokes, of Dublin. Dr. Stokes published a paper in the first volume of the *Dublin Journal of Medical and Chemical Science*, on the use of large doses of opium in peritonitis, and he especially noted its value in "the low typhoid peritonitis arising after delivery." But the treatment which I have described is a good deal more than that recommended by the above authors, and I do not hesitate to say that the records of this hospital will demonstrate a success in the treatment of this disease far beyond that which has ever been secured by any other method.

[1] *Vide* Ramsbotham's "System of Obstetrics," edited by Keating, Philadelphia, 1865, page 538.

[2] *Vide* report of the case at the end of this lecture

(2.) I regard it as very important to allay vascular excitement, as this necessarily leads to a rapid depression of the vital forces. Our predecessors resorted to venesection to accomplish this, but the general experience of the profession led to the universal abandonment of this practice, as it was found that, in this disease, it involved absolute loss of vital power. But, in the veratrum viride, we have an agent which reduces vascular excitement without real loss of vital power. There is a positive distinction between depression of the vital forces and absolute loss of power. As I have, on other occasions, fully discussed the action of the veratrum viride, it is sufficient for me now to say that, in conjunction with the solution of morphia, you will do well, in puerperal peritonitis, to gradually reduce the frequency of the pulse, by the use of the tincture of the veratrum viride. Commence with five drops with each dose of the morphia. By carefully watching the effects, and graduating your doses short of provoking vomiting, you may bring the pulse down to 70 or 80, and then you should endeavor to hold it there. Even if vomiting do come on, and, for a time, your patient seem almost in a state of collapse, this condition need excite no alarm, as it lasts but a short time, and the pulse is effectually reduced in frequency, sometimes to 30 or 40 a minute. I have seen this occur a hundred times at least, and the greatest evil resulting from it is the alarm and excitement which it causes to the friends or attendants. It is, therefore, desirable to avoid this explosion, so to speak, of the action of the veratrum viride, if possible. If the pulse have once been reduced, three, two, or even one drop may be found sufficient to control it. Remember that the veratrum viride controls the excited pulse of inflammation, but does not reduce

the rapid pulse of exhaustion. If, therefore, the disease advance to the stage of purulent cachexia and hectic fever, the veratrum viride should not be given.

(3.) For the pain in the abdomen and the tympanites, we have a remedy of great value in the oil of turpentine. As soon as these symptoms appear, direct that two thicknesses of flannel, sufficiently large to cover the whole abdomen, be dipped in hot water, then wrung out as dry as possible, saturated with the oil of turpentine, and placed over the abdomen. This should be covered with oil-silk and kept on as long as the patient can be persuaded to bear it; that is, from fifteen minutes to a half-hour. The surface should be well reddened by the application. On taking off the flannel, the abdomen should be covered with a light layer of cotton-wool, at least an inch or two in thickness, over which should be poured a couple of teaspoonfuls of laudanum, and this again should be covered with the oil-silk. The patient usually complains bitterly of the smarting and burning from the turpentine, but this subsides in a short time after the flannel has been removed, and then it will be found that the abdomen is much flatter and softer, and that the pain is very much less, the patient being able to move and breathe much more easily. The countenance of the patient is frequently much improved in color, and she appears as if she had been stimulated by a cordial, and often the lochial discharge, which had been suspended, becomes free. For these reasons, I am convinced that the good effects of the turpentine are not wholly, or even chiefly, due to its rubefacient action, but to its absorption. The turpentine-stupes should be reapplied once or twice a day, if the abdomen show a tendency to again become distended and pain

ful, and the cotton-batting with the laudanum should be reapplied every few hours, and continued until the subsidence of the abdominal symptoms. You will observe that the effect of the turpentine applications is very different from that of blisters. I sometimes find the latter very useful, when the symptoms of general peritonitis have, in a great measure, subsided, by apparent localization with induration, almost forming a circumscribed tumor. I have found a blister applied over this point of great service, not only in speedily relieving the pain, but apparently in hastening resolution of the indurated tissues. Great care should be taken to prevent strangury from the use of the blister, and I therefore usually direct that it should be applied in the morning, so that it can be well watched, and that it be taken off and a warm poultice applied as soon as vesication has fairly commenced. In this way, the blistered surface is well filled with the serous exudation, there is very little pain or soreness, and all danger of strangury is averted.

(4.) In all cases where the peritonitis is a lesion of puerperal fever, I regard quinine as an agent of great value. I shall more fully discuss its mode of action and its advantages, in connection with that subject. In all cases of general peritonitis, where the chills are recurrent, or where there are any of the symptoms that I have before described as indicating a tendency to purulent exudation, I believe quinine is indicated. My experience has gradually led me to the conviction that it is most useful when given in full, impressive doses, once or twice a day. As a general practice, in the class of cases that I have just referred to, I give from five to ten grains of the sulphate or the hydrochlorate of quinine in the morning, and from ten to twenty grains in the

evening. It is seldom that patients with this disease complain of the unpleasant effects of the remedy in such doses—such as headache, giddiness, or ringing in the ears—and, if they do, the quantity should be slowly and cautiously reduced, if we would not lose all that we have gained from the use of this agent.

(5.) For many years, I have found alcoholic stimulants of great service in general puerperal peritonitis. I think the following effects can be very manifestly observed to result from their use: (*a.*) They renew the nervous forces, which generally are in a state of extreme prostration, probably, by the cerebral hyperæmia induced by alcohol. In this, as in other diseases with great depression, patients are able to bear four, five, or even ten times the quantity that they could take in health, without any unpleasant effect, or the least approach to intoxication. (*b.*) If alcohol do not act as food, it seems to diminish waste, and thus, according to Dr. Lionel S. Beale, it tends to cause a diseased texture, in which vital changes are abnormally active, to return to its normal and much less active condition. (*c.*) For this reason, it is often of great service in allaying vascular excitement, in connection with the veratrum viride. I have seen many cases in which the specific influence of the veratrum viride as an arterial sedative was not obtained until the use of alcohol was combined with it, and I have repeatedly, in this disease, found that the pulse could not be influenced by either agent alone, but was readily reduced by both conjoined. (*d.*) In the rapid pulse of exhaustion, which we find attending the hectic fever and purulent cachexiæ of this disease, alcoholic stimulants freely given often cause the pulse to fall in frequency, but to increase in force. In puerperal peritonitis, I have often given from half an

ounce to an ounce and a half of whiskey or brandy every hour, and have continued this with advantage for several days, until, as convalescence was established, there was no longer a necessity for its use. I believe that, by the use of alcohol, the lives of some patients have been saved which, without it, would have been lost.

(6.) I regard vaginal injections as very important in this, as in many other of the puerperal diseases. I generally give the following formula:

℞. Glycerin.,	
Acid. carbol. glacial., āā	℥ j.
Aq. puræ,	℥ vj. M.

I direct that a tablespoonful of this should be put in half a pint of water as warm as can be borne, and carefully injected into the vagina, twice a day. If the lochia be very abundant and fetid, the proportion of carbolic acid may be doubled or even quadrupled, and the injection should be used every six or eight hours. Nurses should be carefully instructed so to use the injections as not to annoy or fatigue their patients, who generally, indeed, express themselves as greatly soothed and comforted by their use.

The patient should be urged to take as much as possible of such bland and easily-absorbed nutrition as beef-tea, panada, caudle, milk, or milk and lime-water.

You must strongly insist on the necessity of absolute rest. Make the nurse and friends thoroughly understand that not the slightest movement, active or passive, that causes pain, should be permitted. I have seen a very severe renewal of the disease, which had been apparently subdued, simply from the maladroit efforts of the husband and the nurse to move the patient from one side of the bed to the other. The patient should not be allowed to make any considerable straining effort

to empty the bladder, and, if this cannot be done without severe effort and pain, the catheter should be used.

From what I have said before in regard to the necessity of quieting and arresting peristaltic action, I think that you will naturally infer that, in my opinion, purgatives are to be most carefully avoided. There is infinitely less danger from constipation than from the action of a mild purgative. I have often seen the bowels move easily and without pain after a week had passed without any evacuation. The only exception I make to the rule, forbidding the use of purgatives, is in some very rare cases. Where the vomiting of bilious fluid is excessive in frequency and in quantity, I have given ten grains of calomel well rubbed up with twenty grains of the bicarbonate of soda. A small dose of the calomel would be irritating, as I have learned by experience, but the full dose in this combination is usually followed by two or three painless, fluid evacuations, greatly to the comfort of the patient, in whom generally a very moderate diarrhœa now takes the place of the vomiting. This is the only way in which I ever use mercurials in the treatment of this disease. It seems to me that the old theories as regards the so-called antiplastic and sorbefacient action of mercurials have no foundation in fact; and I therefore read with astonishment in the great work of Hervieux, on "Puerperal Diseases," that, in peritonitis and phlebitis, he finds it advisable to induce salivation if possible by mercurial inunctions, and that, as soon as the gums are touched, he finds a marked improvement in the symptoms of these diseases.

As, until within comparatively a recent period, venesection has been recommended by most standard writers, and has been the almost universal practice in this

disease, I ought, perhaps, to add a few words in regard to it. In this country, this mode of practice has been very generally given up, because observation and experience have demonstrated that general puerperal peritonitis is a disease which tends rapidly to destroy life by asthenia. But I am not sure that we may not have erred in entirely discarding venesection. In my early professional experience, I can distinctly recall two cases in which I thought the life of my patients was saved by it. For twenty years or more, I never bled a patient in this disease, nor have I seen a single instance in this hospital where I think depletion would not have been positively injurious. But I have often thought of a case which I had some years ago in Brooklyn, with a feeling of regret that I had not resorted to venesection. In January last, I did bleed a patient with general puerperal peritonitis, and with such manifest good results, that I shall briefly detail the case. The patient, twenty-two years of age, married eleven months, was delivered, at 8 A. M., January 9th, 1873, of her first child, a boy weighing eleven and a half pounds, after a rapid and normal labor of less than four hours. The placenta and membranes came away entire, immediately after the expulsion of the child, and without hemorrhage. I do not think that an ounce of blood was lost. The uterus contracted well. I had seen the patient but once before her confinement, when she reported herself as being in perfect health and without a single unfavorable symptom. During gestation, she had grown very stout, and had greatly increased in weight. At my visits in the afternoon of the same day and on the next day, her condition was just as I wished to see it in every respect. The nurse, however, remarked that the lochial discharge was hardly suffi-

cient to make a stain. At 10 A. M., January 11th, the pulse and respiration were normal, temperature 99.5°, but the breasts were very full and tender. As the nurse again spoke of the scanty lochial discharge, I very thoroughly examined the abdomen, and found it flat, the uterus well contracted, and even strong pressure was well borne over every part of the abdomen. The bowels had moved without medicine early in the morning. The patient had slept so well as not to be awakened by the crying of the baby, and, except for the tenderness of the breasts, she expressed herself feeling as well able to get up and move about as before her confinement. At 6 P. M., she complained of pain in passing a very small quantity of water. She made another effort at 9 P. M., but it caused so much pain, that it was unsuccessful. Hot flannels were applied to the abdomen, and she went to sleep. Soon after 11 o'clock, she was awakened by a severe chill, which lasted a long time, during which she began to complain of intense pain in the abdomen. I saw her at 2 A. M., January 12th. She was then lying on her back, breathing very rapidly, and each breath was accompanied by a groan of agony. Her face was much flushed, her eyes red, as if she had been weeping, the pulse was 116, very full and hard, and the skin was very hot—I did not at this time stop to ascertain the temperature by the thermometer—the abdomen was enormously swollen. She was much nauseated, and had vomited three times since the chill. I immediately took from the arm about twenty ounces of blood. I next introduced the catheter and drew off about ten ounces of urine, which, on a subsequent examination with heat and nitric acid, became nearly one-half solidified. Turpentine-stupes were at once applied to the abdomen, and I injected hypodermically twelve drops of the following solution:

Morphiæ sulph.,	grs. xvj.
Atropin.,	gr. j.
Aquæ,	℥j.

At 6 A. M., and hourly afterward, she took ten drops of Magendie's solution. I left her quietly sleeping, soon after 9 A. M. I need not detail the subsequent history of the case, and I shall only add that, three days after, not a trace of albumen could be found in the urine; and every vestige of the peritonitis had disappeared at the end of ten days. I think that there can be no question as to the usefulness of bloodletting in some such very exceptional cases as that I have just described.

You will find, gentlemen, that many writers speak of general puerperal peritonitis as a very hopeless disease; and the past statistics of large hospitals, in which we have the results of this disease chiefly in severe epidemics of puerperal fever, seem to justify so desponding a view. But I think, at the present day, the therapeutics of this disease are based on a much more correct pathology, are dictated by good sense and sound reason, instead of by theory and routine-precedent, and that, in consequence of this, the ratio of fatality is reduced at least one-half. It is my belief that there are few diseases in which the physician can see so satisfactorily demonstrated the results of active and positive therapeutical agencies.

I append to this lecture, as rather forcibly illustrating some of the views expressed therein, the report of the following interesting case, by Dr. Howard Pinkney:

"CASE XXVIII.—Mrs. H——, aged about twenty years, daughter of a physician, was taken in labor on the evening of March 27, 1872, with her first child. I was called early the following morning, and found the patient greatly fatigued and exhausted from frequent and severe pains. The os was fully dilated, and the head was en-

gaged in the superior strait. The pains were accompanied with frequent desire to micturate, and considerable tenesmus. I again saw her about three hours after, still suffering great pain, and, there being no advance of the head, I applied the forceps and delivered a living male child, weighing about eight pounds. The mother and child did remarkably well until April 5th, or eight days after delivery, at which time I found the mother suffering from acute pain in the hypogastric region. Upon inquiry, I found that she had been sitting up the evening before, and dressed her little sister for a concert in which she was to take part. After having been dressed, the child said or did something that threw the patient into convulsive fits of laughter, causing considerable pain in her sides. The pain was so severe when I saw her, that I immediately gave gtts. x of Magendie's solution hypodermically, and applied warm fomentations to the abdomen. This was followed by gtts. vj of the Magendie, and gtts. iij of veratrum viride, every two hours, until the pain should be relieved and the pulse reduced. On April 6th, 7th, and 8th, the patient did well, so that the medicines were discontinued, although the milk diminished in quantity and disappeared. On the 9th, the patient suddenly became worse, without any apparent cause, the pulse running up to 160, temperature to 104.5, and the respiration to 32. Morphia and veratrum viride were again immediately resorted to, and, between 12 M. of the 9th to 12 M. of the 10th, 440 drops of Magendie's solution were given by the mouth, and 47 drops, by hypodermic injections.

					gtts.			
From 12 M., April	10,	to 12 M., April	11,	995	by the mouth,	47	hypod.
"	11,	"	"	12,	1,070	"	30	"
"	12,	"	"	13,	1,340	"	120	"
"	13,	"	"	14,	940	"	170	"
"	14,	"	"	15,	550	"	90	"
"	15,	"	"	16,	450	"	160	"
"	16,	"	"	17,	2,010	"	60	"
"	17,	"	"	18,	1,980	"	none	"
"	18,	"	"	19,	2,490	"	"	"
"	19,	"	"	20,	980	"	"	"
"	20,	"	"	21,	320 drops of McMunn's elixir.			

"It will thus be seen, that the patient took, during eleven days, 13,969 drops of morphine, 724 of which were given hypodermically. An hourly record of the case, from the time the patient was seen by Professor Fordyce Barker, is appended. After April 21st, the patient made a rapid and perfect recovery."

Record kept by the father of the patient, a physician, who devoted his time exclusively to the care of his daughter, from the time she was seen by Professor Barker until her convalescence. She was generally visited three times a day by Dr. Pinkney.

TIME.	Magendie's sol. of morphine, internally.	Solution of morphine, hypodermically.	Veratrum viride.	Brandy.	Pulse.	Temperature.	Respiration.	REMARKS.
Hours.	Gtts.	Gtts.	Gtts.					Professor Barker, with Dr. Pinkney. Enormous tympanitic distention of abdomen. Pain severe; respiration wholly thoracic. To have milk or beef-tea *ad libitum*. Brandy, a half-ounce every hour.
Wed'y, Apl. 10.								
2.15 P. M.....				ʒi ss	130	104½	34	
2.45 "		12						
3.10 "			6	ʒi ss				
4.00 "		15						
4.20 "			6	ʒi ss				
5.00 "	45							
5.30 "			6	ʒi ss				Between 5 and 7 P. M., slept.
6.10 "	55							
6.30 "			6	ʒi ss				
7.00 "	60							
7.30 "			6	ʒi ss				
8.00 "		20						
8.30 "			6					
9.00 "	70							
10.15 "	90		6	ʒi ss	160		20	Very feeble, and restless.
11.20 "	60		6	ʒi ss				
11.40 "								Sweating.
12.00 "	90			ʒi ss	140			
Thurs., Apl. 11.			6					
1.15 A. M.....	25		6	ʒi ss				No sleep.
2.10 "	30		6	ʒi ss				
3.15 "	20		6	ʒi ss				
4.00 "	80		6	ʒi ss			20	
5.00 "	80			ʒi ss				
8.00 "	90			ʒi ss	108		30	Slept some, between 8 and 10.
9.00 "	90			ʒi ss				
10.30 "	50							Great pain in urinating, and severe burning and constant pain in region of the bladder.
11.30 "	60			ʒi ss			34	
1.10 P. M.....	30			ʒj				Injection of starch and carbolic acid, by direction of Professor Barker.
1.40 "	40			ʒi ss	108	102	28	
2.45 "	40							
3.30 "	90		8	ʒj	140	103½		
4.45 "	90		8	ʒi ss	136	103¼		
6.05 "	60		6	ʒj	134			
7.15 "	80		6	ʒi ss	136	104		
8.15 "	80		6		128	103½		
9.40 "	80			ʒj		104½		
10.50 "			6			104½		
11.15 "	80			ʒj				
Friday, Apl. 12.								The respiration became slower. Constant nausea.
1.30 A. M.....	80			ʒj	120	104½	16	Pulse feeble and thread-like. Impulse of heart very weak.
2.15 "			6					
2.45 "		30						Professor Barker substituted digitalis in place of veratrum viride.
3.45 " ...	80			ʒj				

RECORD OF CASE—(*Continued*).

TIME.	Magendie's sol. of morphine, internally.	Solution of morphine, hypodermically.	Tincture of digitalis.	Brandy.	Pulse.	Temperature.	Respiration.	REMARKS.
Hours.	Gtts.	Gtts.	Gtts.					
Friday, Apl. 12.								
5.50 A. M.....	80			℥j		$102\frac{1}{2}$	—	
8.45 "	80			℥j		$101\frac{3}{4}$		
9.45 "			10					
10.45 "	80					$101\frac{1}{4}$		
11.15 "								
12.45 P. M.....	70						24	Appears much better. Has slept considerably.
1.45 "	70			℥ss		$101\frac{3}{4}$		Vaginal injection as before.
2.45 "	70			℥ss	96	$101\frac{3}{4}$		
4.00 "	70			℥ss				
4.20 "		30			132	$102\frac{1}{4}$		
5.20 "	70			℥ss				Nurse obliged to leave her, by which she was much excited.
6.15 "		30			128	$102\frac{3}{4}$		
8.05 "	80					$103\frac{1}{2}$		
9.40 "	80				154	104	32	
10.40 "	80				148	$103\frac{3}{4}$		
11.45 "	80							
				Verat. viride.				
Satur'y, Apl. 13.								
1.10 A. M.....	80			10	140			Constant and severe pain.
2.10 "	80					$103\frac{1}{2}$		Vaginal injection.
2.45 "		30						
3.15 "	80							
3.45 " ...	80							
4.30 "			10			$103\frac{1}{2}$		
4.40 "	80				128			
5.05 "		30						Pain much relieved, but no sleep since one o'clock yesterday afternoon.
5.50 "	30		10		120	103		
6.30 "		30						
8.00 "	80							
9.30 "	80							
11.00 "	80		10		128	103		
				Brandy.				
12.00 M.	80	20	10	℥ss	128	103		
1.40 P. M.....				℥ss	128	$103\frac{1}{8}$	24	No sleep.
1.55 "	80							
2.40 "		30		℥j				Vaginal injection.
4.35 "			10	℥j		$102\frac{1}{2}$		
5.00 "		30						
7.20 "				℥j	120	102	24	At 9.30 an involuntary and unconscious discharge from the bowels.
10.00 "		30						
10.40 "	80			℥j				Intense pain.
12.00 "	80			℥j	120	$102\frac{3}{4}$	30	
Sunday, Apl. 14.								
1.00 A. M.....		30	10	℥ss	120	$102\frac{1}{4}$		No sleep. General appearance very much worse. Evidently failing.
2 30 "	90			℥j				

RECORD OF CASE—(*Continued*).

TIME.	Magendie's sol. of morphine internally.	Solution of morphine, hypodermically.	Quinine.	Brandy.	Pulse.	Temperature.	Respiration.	REMARKS.
Hours.	Gtts.	Gtts.						
Sunday, Apl. 14.								
3.00 A. M.....		30						
4.25 "	80			℥ j	126	103		
5.20 "	90			℥ j				
6.20 "	90			℥ j				
7.50 "	90			℥ j				
8.50 "	90			℥ j				
9.30 "			grs. x			101		
10.00 "				℥ j	108	102½		A very large and extremely offensive passage from the bowels, without pain, followed by collapse, and very cold extremities.
11.20 "	90			℥ j				
1.45 P. M.....	90			℥ j	108	101		
3.15 "	90			℥ j				
4.05 "	90			℥ j				
4.15 "		30						
4.25 "		30						Blister, 5 × 5, over hypogastrium.
6.00 "	80			℥ j	120	102	28	
7.10 "	80		grs. xv.	℥ ss				
8.00 "	80			℥ j		102½		
			Digitalis					
9.10 "	80		10					Removed blister, and applied poultice.
10.00 "	80			℥ j	120	103		
11.00 "	90			℥ j		102⅞		
12.00 "	80			℥ ss				No sleep; refuses brandy.
Monday, Apl. 15.								
			Hydrat. chloral.					
1.00 A. M.....	80		10 grs					
2.00 "	90				112	102¼		
3.00 "		30	10 grs					
3.30 "	90							
5.15 "	90		10 grs					
6.00 "	90					101¼		
7.00 "	90			℥ ss				Quinine, grs. x.
8.00 "				℥ ss		102		A very large passage from the bowels, without pain.
8.30 "	90		10 grs					
10.30 "	90			℥ j				Vaginal injection.
11.00 "			10 grs					
12.00 M.								A large passage.
1.00 P. M.....				℥ j	128	101¼	27	
2.00 "			10 grs					
3.00 "		20						Quinine, grs. xv.
5.00 "		50	15 grs		128	101¼	28	No pain after this hypodermic injection. Begins to get short and frequent naps.
8.15 "			15 grs	℥ j	128	102¼	28	
10.30 "				℥ ss	128	101¼	28	
12.00 "			15 grs		128	102¼	28	Complains of severe pain under left breast, after taking any thing in the stomach.
Tuesday, Apl. 16								
2.00 A. M.....					120	101¼	27	
3.40 "			15 grs					

RECORD OF CASE—(*Continued*).

TIME.	Magendie's sol. of morphine internally.	Solution of morphine, hypodermically.	Veratrum viride.	Brandy.	Pulse.	Temperature.	Respiration.	REMARKS.
Hours.	Gtts.	Gtts.	Gtts.					
Tuesday, Apl. 16								
5.00 A. M.....		30						
6.00 "		30			112	100¾	28	Has slept soundly nearly two hours.
7.15 "	90							
8.15 "	90							
8.30 "		30						
9.20 "	90							
9.50 "	90					99½	25	
11.20 "						99		
11.30 "	90				112			
12.15 P. M.....					104			
1.00 "	90							
1.45 "					120	100	23	
2.45 "	90			ʒj				
3.30 "		30				99		Pain very severe in chest and left shoulder.
4.45 "	90			Brandy ʒj.				
6.00 "	90							
7.00 "	90			ss				
8.00 "	90			ss				No sleep.
9.00 "	90			ss				
10.00 "	90		10		140	99	30	Breathing badly.
11.00 "	90			ʒj				Quinine, gr. xv.
12.00 "	90		10					
Wed'y, Apl. 17.								
1.00 A. M.....	90							
1.30 "			6		128	100	28	
2.00 " 120				Brandy ss				
3.10 "	90			ss				
3.45 "		30	6					
4.15 "	90			ss				
4.45 "	90							
6.00 "	90		6		128	100½	27	
6.45 "	90			ʒj				
7.30 "	90							
8.30 "	90		6					
9.30 "	90			ʒj	111	99	26	Sleeping finely.
10.30 "	90							Calls for food.
11.50 "	90			ʒj				
12.30 P. M.....	90		6					
1.25 "	90			ʒj				Moved her to another room, which she bore well.
2.00 "	90		6					
3.00 "	90			ʒj				Sleeps between each dose.
3.30 "	90		6					
4.00 "	90				112			
5.00 "	90			ʒj				
		Quin.						
6.00 "	90	gr. xv						
8.00 "	90		6	ʒj	112	99½	28	

RECORD OF CASE—(*Continued*).

TIME.	Magendie's sol. of morphine internally.	Veratrum viride.	Brandy.	Pulse.	Temperature.	Respiration.	REMARKS.
Hours.	Gtts.	Gtts.					
Wed'y, Apl. 17.							
10.00 P. M.....	90						
12.00 "	90		ʒj				
Thurs'y, Apl. 18.							
1.00 A. M.....	90		ʒj	112	100$\frac{2}{4}$	27	
1.45 "	90						
3.00 "	90						
3.30 "	90						
5 10 "	90						
6.20 "	90				101$\frac{3}{4}$		
7.40 "	90						Lay on her back for two hours. Complains greatly of difficulty in breathing.
8.20 "	90						
9.00 "					103$\frac{1}{4}$	34	
9.45 "	90						
10.00 "	90						
11.45 "	90						
1.00 P. M.....							
1.50 "	90	3	ʒss				Has taken more nourishment than usual.
2.20 "	90						
2.50 "		3	ʒss	103			Dr. Barker finds pleuritic effusion in the left side.
3.20 "	90						
3.50 "	90		ʒss				
4.00 "		3					
4.20 "	90						Sleeps well, but often starts and jumps in her sleep.
5 00 "		3					
5.25 "	90	6	ʒj	144	101$\frac{1}{4}$	36	
6.15 "	90	6					
6.40 "		6	ʒj				
7.00 "	90						
7.45 "	90						
8.00 "	90	3	ʒss	120	102$\frac{1}{2}$	28	
8.50 "	90						
9.50 "	90	3					Very large passage from the bowels.
10.50 "	90						
11.15 "		3	ʒj				
12.00 "	90			122	104$\frac{1}{4}$	28	
Friday, Apl. 19.							
12.50 A. M.....	90						
1.10 "		3					A second large passage.
1.20 "	90		ʒj				
1.30 "				122	103	28	
2.00 "	90						
2.30 "	90		ʒss				Sleeps well.
3.30 "	90						
4.10 "	120		ʒss				
4.45 "	90						
5.00 "		3	ʒss		102		Pain most intense.
6.00 "	120				102$\frac{1}{4}$		
7.00 "	90	3					

RECORD OF CASE—(*Continued*).

TIME.	Magendie's sol. of morphine internally.	Veratrum viride.	Digitalis.	Quinine.	Pulse.	Temperature.	Respiration.	REMARKS.
Hours.	Gtts.	Gtts.	Gtts.	Grs.				
Friday, Apl. 19.								
8.40 A. M.	90					103		
9.05 "		3						
9.15 "		3			120		30	
9.40 "	90							Pain in left chest very severe.
10.40 "	90							
11.40 "	90							
1.00 P. M.		3			120	104	30	Applied blister to left side of chest.
1.25 "	90							
3.00 "	90	3						
4.00 "	90							Two large passages.
5.00 "	90							
5.45 "		3			120	103		
6.30 "								Removed blister and applied poultice.
7.30 "	80							
8.00 "		3			120	104	25	Quinine, gr. xv.
10.30 "		3						
11.00 "						$103\frac{1}{2}$		Very large and watery movement of the bowels.
Satur'y, Apl. 20.								
12.30 A. M.	90							Gave rectal injection of two ounces of starch and one drachm of McMunn's elixir opii.
2.15 "		5			144	$103\frac{3}{4}$		
2.25 "	90							Went to sleep.
2.50 "		5						
4.15 "		5			144	$103\frac{3}{4}$		
4.40 "	90							Great difficulty in passing water.
6.00 "		5						
6.30 "	90					103		
7.30 "		5						
8.30 "	90							Complains of great pain and difficulty in passing water.
9.30 "		6				104		
10.15 "	90							
10.30 "		6						
10.50 "					132	$103\frac{3}{4}$		
11.30 "			6	10				Vaginal injections.
12.55 P. M.			10		136	$103\frac{1}{4}$	24	Dr. Barker suggests the Magendie's solution be given up, and McMunn's elixir opii given instead.
1.15 "								
	McMunn's elixir.							
1.20 "	60		6					
2.35 "	80				132		24	Sleeps now most of the time.
4.45 "					120	$102\frac{1}{2}$	24	
6.00 "					118	$102\frac{1}{2}$	24	
7.00 "	60							Micturates with great pain and scalding. Afterward very faint. but face crimson, calling for air
8.50 "				15				
9.00 "					120	$102\frac{1}{2}$	24	
10.00 "			6					
12.00 "					120	120	24	Cold sweat, extremities cold.

RECORD OF CASE—(*Continued*).

TIME.	McMunn's elixir opii.	Tinct. ferri chloridi.	Digitalis.	Pulse.	Temperature.	Respiration.	REMARKS.
Hours.			Gtts.				
Sunday, April 21....							
12.15 A. M.....	60						
2.50 "				120	102¼	24	
3.10 "							Slept some, but breathes badly.
3.15 "			6				
4.25 "	60						
			Quin.				
7.00 "			gr. x	120	102	24	
9.10 "				120	101⅝	24	
11.00 "					101¼		
12.30 P. M.....		5		120			Dr. Barker suggests tinc. ferri chloridi, in 5-drop doses every hour.
1.30 "		5					
2.30 "		5					
3.30 "		5					
4.50 "		5					Takes more nourishment—brandy, milk, and eggs. Pain and swelling in left groin, which was painted over with iodine.
5.00 "				120	101¾		
5.30 "		5					
6.30 "		5					
8.00 "		5		120	101¾		Pulse very much stronger, and of better character.
9.00 "		5					
10.00 "		5			101¾		
11.35 "		5					
Monday, April 22....							
1.00 A. M.....		5					Pain and scalding still severe in micturition, and constant in the vagina.
2.00 "		5					
3.25 "		5					
4.00 "							Severe griping pain in abdomen, followed by an enormous, green, clay-colored stool.
4.40 "		5					
8.20 "		5					Another enormous and painful discharge from the bowels.
9.15 "		5					
10.45 "		5		108			Perspirations, yet complains of being cold.
12.00 M.		5					
1.30 P. M.....							
2.30 "					100½	35	Good appetite. Asks for beef-steak, which is given.
3.40 "		5					
6.15 "		5					
8.25 "						32	
9.20 "		5		96	99¾	32	
9.45 "							Nauseated, and finally vomits. Mustard-plaster to stomach.
12.00 "		5					
Tuesday, April 23....							
1.00 "		5		108	99½	32	Asks for beef-tea. Breathes easier, and looks much better. Sleeps.
3.00 "		5					
4.30 "		5					
6.00 A. M.....		5		112	99¾	32	
8.15 "		5					
10.20 "		5					

RECORD OF CASE—(*Continued*).

TIME.	Tinct. ferri. chloridi.	Pulse.	Temperature.	Respiration.	REMARKS.
Hours.					
Tuesday, Apl. 23					
10.30 A. M.....		104	99		
12.40 P. M.....	5				
1.50 "	5	100	98$\frac{3}{4}$		
4.00 "	5	100	98$\frac{3}{4}$	28	
5.00 "	5				From this time, the convalescence was very rapid.
7.00 "	5				
8.50 " ...		100	98$\frac{3}{4}$		
9.15 "	5				
11.00 "	5				

LECTURE XVII.

PELVIC PERITONITIS AND PELVIC CELLULITIS.

Case—Epidemic influence not confined to zymotic diseases—Pelvic peritonitis and cellulitis are often met with when puerperal fever is epidemic—What is understood by the terms pelvic peritonitis and pelvic cellulitis—Reasons for using these terms instead of others which have been proposed—Causes—Pathological anatomy—Cases—Duration—Terminations; (*a*) resolution; (*b*) adhesions; permanency of these adhesions; (*c*) suppuration—Treatment.

"CASE XXIX.[1]—Mary R——, aged twenty-eight, born in Ireland, widow, had one child four years ago, which she says was delivered by instruments and was still-born. After this confinement, she soon recovered her health. Her second labor began November 18th, and lasted about twenty-four hours. The child presented by the foot, was still-born, and weighed thirteen pounds. The fourth day after delivery, the patient had a severe chill, followed by high fever, abdominal pain and tenderness, nausea, and vomiting of a greenish material. The record shows that for three days she had a pulse ranging from 116 to 128, and a temperature of 103°–104°. She was treated by morphine and veratrum viride, turpentine-stupes and abdominal fomentations, quinine and stimulants p. r. n. Ten days after, on the fourteenth day after her confinement, all bad symptoms had disappeared, and she was able to be up and walk about the ward.

"*December 18th.*—She was transferred from the convalescent lying-in ward to the uterine ward, of which I then had charge. A few days before her removal to my ward, she had a recurrence of chills, with moderate abdominal pain and tenderness, loss of appetite, and profuse perspirations. On my first examination, her pulse

[1] Reported by Walter Judson, M. D., house-physician to Bellevue Hospital.

was 128 and very feeble; temperature 103.5°, some abdominal pain and tenderness, and moderate tympanites, vomiting occasionally a greenish matter, bowels constipated, micturition not painful, now and then slight chills, but very frequent and quite profuse perspirations, countenance anxious, and eyes sunken and surrounded by dark lines. On vaginal examination, the uterus was immovable, with great tenderness on all sides, but much more marked in Douglas's *cul-de-sac* and on the left side of the uterus. The patient was treated by hypodermic injections of morphia, stimulants p. r. n., and large doses of quinine with dilute phosphoric acid.

"*December 20th.*—Pulse 140; temperature 104.5°; symptoms as before, but worse.

"*December 22d.*—Patient rapidly failing; temperature 105°; pulse 160; profuse perspirations and occasional delirium. Died at 5 P. M., December 22, 1870.

"*Autopsy.*—Larynx and trachea present yellowish mucus in their interior, with the odor of gastric juice. Brain, heart, lungs, and liver, normal, as also were the kidneys and spleen. Stomach and intestines distended with gas, and the stomach was filled with a large quantity of yellowish fluid, which had the odor of gastric juice. The intestines were glued together, and, in the pelvis, on the left side, there was an abscess shut in between a knuckle of intestine, the uterus, and the broad ligament. Within the broad ligament of this side, there was also an abscess, which communicated with the peritoneal abscess. The uterus was four inches in length, and all its tissues appeared normal for the time after delivery. The ovaries were also normal."

Gentlemen: I suppose that there is no one subject pertaining to medical science, concerning which our ignorance is more absolute, than with regard to the causes and nature of epidemic influence. It bloweth where it listeth and we see the effects thereof, but cannot tell whence it cometh or whither it goeth.

For the last two years, small-pox has been prevalent in all the great cities of the civilized world—in London, Paris, Berlin, Manchester, Liverpool, New York, and Philadelphia—to an extent not known before for half a century; and it is found that great numbers at this time

are susceptible to the vaccine virus, who have been often vaccinated before, without any result. And so I might refer to cholera, influenza, diphtheria, and numerous other diseases, which at various times have appeared in the same way. Neither is this epidemic influence restricted to what are called zymotic diseases. We see it equally apparent in what we generally regard as local inflammations, of which I might give numerous illustrations. In the winter of 1859–'60, this influence was very remarkable in the development of mastitis and mammary abscess, not only in this city, but, as I have learned from the statements of physicians, in other parts of this State and in New England. At that time, three out of every four who were delivered in this hospital exhibited more or less tendency to mammary abscess, until I adopted the plan of putting every one after delivery under treatment, with full doses of quinine, which proved to be an efficient prophylactic. Now I can almost say, that we have an epidemic of pelvic peritonitis and pelvic cellulitis.

When I came on duty at my present term of service, there were four of these cases in the obstetric, and seventeen in the uterine wards, of which thirteen originated during the puerperal period. I may add that I have seen, within a few weeks past, eight cases of this kind, occurring in puerperal women, and I have heard of others seen by Dr. Peaslee and Dr. Thomas, within a certain district of the northeast part of the city, that is, between Fifty-fifth and One Hundred and Fourth Streets, east of Central Park. When puerperal fever is endemic in this hospital, we generally have a few cases of pelvic peritonitis and pelvic cellulitis. It would seem that they occurred in patients who were moderately infected by this poison, but only to such a degree

as to cause these local troubles. So my friends, Dr. Sims and Dr. Emmet, have often remarked to me, that they could always assume that we had puerperal fever in Bellevue, when they found that they could not perform any surgical operation on the pelvic organs at the Woman's Hospital, on account of the great tendency to pelvic peritonitis and pelvic cellulitis. But at the present time, and for months past, we have had no puerperal fever in the hospital, nor have I heard of a case in the city. I mention this latter fact because eleven of the thirteen cases in the uterine wards were not delivered in the hospital.

Before going any farther, I shall define what I mean by pelvic peritonitis and pelvic cellulitis, because these terms were not found in medical writings until within a comparatively recent period; and I shall also briefly give my reasons for adhering to their use, instead of accepting others which have been proposed. By pelvic peritonitis is meant, inflammation of the serous covering of the uterus, or of its appendages. Virchow has proposed the term peri-metritis for this inflammation, using the Greek word *περὶ*, as implying inflammation of serous membranes, and *παρα*, to imply inflammation of the cellular, or connective tissues. These terms have been adopted by many in Germany and by a few in other countries, the most eminent of whom are Matthews Duncan, of Edinburgh, and the late M. Aran, of Paris. But I very much doubt whether they will ever be generally accepted, and for these reasons: (1.) There is nothing significant in the Greek word *περὶ*, as carrying the idea of serous membranes, or in the word *παρα*, as referring distinctly to cellular or connective tissue. (2.) Their use in this arbitrary sense is not warranted either by precedent from analogous usage, as

applied to any other organs of the body, or by the necessity for new terms to distinctly define the disease. No one, as yet, has proposed to substitute the word peri-pneumonitis for pleuritis, or endo-pneumonitis for bronchitis. It is true that we have the word pericarditis, meaning inflammation of the serous covering of the heart, but this word is used because pericardium is the accepted name of this serous membrane, and not for any reason in connection with the prefix peri. (3.) Because these prefixes have already been adopted in medical literature, with a different and even an antagonistic meaning. Trousseau uses the term *abcès peri-nephrique* (perinephritic abscess), and *abcès peri-hysterique* (perimetritic abscess), meaning, in both instances, abscess of the cellular tissue around these organs. Dunglison, in his "Medical Dictionary," uses the word *para-nephritis*, to express inflammation of the suprarenal capsules. Professor Thomas, who has an evident predilection for classical nomenclature, in which he is generally very correct, devotes a chapter of his most excellent work on "Diseases of Women," to *Periuterine cellulitis*, a Greek prefix used in exactly the opposite sense to that which Virchow proposed, conjoined with a Latin noun.

By pelvic cellulitis is meant inflammation of the cellular or connective tissue around the uterus, the ovaries and broad ligaments. The terms periuterine or perimetritic phlegmon, inflammation or abscess of the broad ligaments, and pelvic abscess, have each been used by different writers to describe the same disease, but all of them are objectionable, from the fact that each describes only a limited phase or a certain stage of the disease.

We study pelvic peritonitis and pelvic cellulitis to-

gether, because they are usually associated with each other, and it is often very difficult, and frequently quite impossible, to determine which disease preponderates or is the primary affection, and because the therapeutic indications are very much the same in both. The two affections occur in non-puerperal women, but I beg that you will bear in mind that all I have to say in regard to them will be confined to their discussion as puerperal diseases.

Both affections originate from the same common causes, which I shall mention in the order of frequency, as they have occurred under my personal observation:

(1.) The special poison of puerperal fever and epidemic influence.

(2.) Imprudences, such as rising out of bed prematurely, too long continuance in the erect posture, too early resumption of family duties or of sexual intercourse, etc.

(3.) Metritis, especially endometritis and phlebitis. I have very little doubt of the cardinal fact which Dr. Matthews Duncan so strenuously insists upon, that both of these affections primarily originate in some uterine lesion, but, as cases come under our observation in actual practice, we have not always positive evidence of this, even after the most careful inquiry into their antecedent history.

Inflammation of the peritonæum in the pelvic cavity produces the same results as when it occurs in other parts of this serous membrane. There is first hyperæmia of the tissues, and then exudation. The disease may terminate at this stage by absorption and resolution, or in adhesion, and there results agglutination of the different organs within the pelvic cavity. Thus we find adhesions of the uterus to the rectum, to

the bladder, to the ovaries, to the Fallopian tubes, to any part of the broad ligaments, or to some portion of the intestines, as in the case just read to you, in which the adhesions between the broad ligament of the left side and a knuckle of intestine included a purulent collection. Dr. Matthews Duncan was the first to signalize the fact that the serous effusion in some cases becomes encysted by adhesions. I have no doubt of this fact, and I shall to-day bring before you the patient, whom you saw two weeks ago, when, at the close of my lecture, I drew off nearly two ounces of serum from what I suppose to be such a cyst.

In a more advanced stage of pelvic peritonitis, the effusion becomes sero-purulent or purulent, with a tendency to accumulate in the more dependent parts of the pelvic cavity. But suppuration may occur at any part of the peritonæum, and in different parts at different periods, and small purulent cavities may be found, inclosed by adhesions, between the uterus and the bladder, or the uterus and the rectum, or on the surface of the broad ligaments, or included between intestinal adhesions and the uterus or some of its appendages. In some cases, the suppuration results in one large purulent collection, and this may terminate in perforation and discharge into the cavity of either of the viscera to which it may be adherent.

The most frequent seat of pelvic cellulitis is at that point of the cervix uteri, posteriorly and laterally, where the vagina is attached, as here the cellular tissue communicates freely with that which surrounds the vagina, and also with the cellular tissue of the adjacent organs and the iliac fossa; in the broad ligaments; and posteriorly, between the vagina and that part of the peritonæum which covers the recto-uterine *cul-de-sac*. The

cellulitis is not confined to the original seat of the attack, but extends by contiguity to all the cellular tissue in the pelvic cavity. It follows the same laws as phlegmon in other parts of the body, and may terminate by resolution or suppuration.

Before describing to you the signs and symptoms of pelvic peritonitis and pelvic cellulitis, I shall bring before you two cases, which will aid me in giving you a clear idea of these affections:

You will remember the first patient, Bridget M——, whom you saw in this room two weeks ago to-day. I shall briefly recall to your minds the chief points in her case. She is married and has had four children, the last of which was born October 16th. She was attended at that time by a midwife, but her labor was less than two hours. One week after, she was able to be up and resume her ordinary work; that is, to do the cooking for her family and take care of her children. The day that her child was three weeks old, while engaged in washing clothes, she began to suffer from "pain in the womb," as she says, and this finally became so severe that she was at last compelled to give up her work and go to bed. She does not recollect that she had any chills, but she was quite unable to pass water either that day or night. The next morning, she had nausea and vomiting, and the pain had extended over the whole abdomen. In the afternoon, she was visited by the midwife, who told her that she had "falling of the womb," and pretended to replace it. She also put a hot poultice over the abdomen, and gave her sweet spirits of nitre. After this, she passed a little water every few minutes day and night, but always with great pain. The third day from her attack, she was visited by a dispensary physician, who advised that

she should be removed to this hospital. She was brought here the next day, November 10th, and Dr. McBride, finding that her bowels had not been moved for several days, ordered a full dose of castor-oil, and an enema a few hours after, if the oil did not operate. It was found impossible to give her the enema, as it not only caused her great pain, but it would not pass into the bowels. However, the oil acted very freely during the night, although its action was painful. I first saw her in this amphitheatre, November 11th. You will remember that her countenance was very anxious and sunken, and her pulse very rapid, but we could draw no inference from these symptoms, as she was very much excited and nervous in being brought before such a crowd of young men. She lay on her back with her left leg drawn up, which she said was the position that caused her the least suffering. On physical examination, I first introduced a catheter and drew off about eight ounces of very offensive urine. We then found a decided prominence in the left inguinal region, as compared with the right, and this could be seen very plainly by you all, when I persuaded her to extend her left leg for a moment or two. This prominence was very painful on pressure, so that I was unable to make out any well-defined tumor, but the swelling seemed to extend above Poupart's ligament. Pressure was much better borne over the right inguinal region, and you will remember that I thought I could distinctly trace the fundus uteri here, just above the pubis. On vaginal examination, I described the pelvic cavity as being filled; and particularly the left half, as being full, hard, and very sensitive to pressure, while it was very evident that there was marked right lateral obliquity of the body of the uterus. The cer-

vix was large and tender, and the uterus was fixed and immovable in any direction. A rectal exploration confirmed the conclusion that I had arrived at from vaginal examination, but, on compressing the swelling on the left side of the uterus between the first finger in the vagina and the second finger in the rectum, I was quite sure that I got an elastic, yielding impression which was due to a contained fluid. Now, although she would not admit that she had ever had chills or even passing chilly sensations, yet my diagnosis was abscess of the left broad ligament, and I expected to demonstrate its correctness by passing into the swelling a small exploring trocar, and getting some drops of pus; but, instead of pus, you saw flow through the canula, nearly two ounces of a straw-colored fluid, without any purulent aspect. I then remarked that it appeared to be one of those cases of pelvic peritonitis which I had never before met with, but which had been described by Dr. Matthews Duncan as "serous encysted peri-metritis."

My directions were, that the patient should remain in bed, and that rectal suppositories of opium and butter of cacao should be used as often as was found necessary to keep her free from pain, that the left inguinal region should be painted twice a day with the tincture of iodine, and that every other morning she should take our compound laxative powder of magnesia,[1] and, as she was very anæmic, she was also to have twenty drops of the tincture of the chloride of iron and three grains of sulphate of quinine, three times a day.

[1] ℞. Magnesiæ carb.,
Magnesiæ sulph.,
Sulphur. sublim.,
Potass. bitart., } āā ʒ ss.

M. S. From a teaspoonful to tablespoonful of the powder, in sugar and water, early in the morning.

For the last four days, she has been up and around her ward, and to-day she insisted that, instead of being carried on a stretcher, she was able to walk up to this room, but this we would not permit her to do. You now see the great change in her appearance. The mammary secretion, which was very scanty when she entered the hospital, is now abundant, she declares that she has now absolutely no pain, and she is anxious to leave the hospital and return to her family. But, as there is still a good deal of tenderness and tumefaction around the uterus, which remains fixed and immovable, we shall try to persuade her to remain here another week.

In the next patient, we have quite a different history, which Dr. McCreery will please read to you:

"Case XXX.[1]—Annie N——, aged twenty-five, born in England, married, was delivered of a boy, after an easy labor of five hours, August 8, 1871. She had one child five years ago, which died of scarlet fever when about three years of age. The patient did well for the first eight days after confinement, but then, after being moved from one ward to another, she began to complain of pain in the left inguinal region, which, she says, was relieved by walking, and was worse at night and in bad weather. I could not get a very satisfactory history of her case during this time, as Dr. ——, who then had charge of her, is now ill, but I am told that this pain continued, and the patient began to lose appetite and strength, and emaciated rapidly. Early in October, a small, hard swelling was noticed in the left groin, which rapidly enlarged and softened, and, in about ten days, was opened, giving exit to very little pus, but to a great deal of offensive gas. Poultices were applied, and on the next day the opening began to freely discharge pus, and continued to do so for twelve or fourteen days, when it gradually decreased, and the escape of offensive gas from the opening entirely ceased, but she neither recovered her appetite nor strength. On the 1st of November, she came under my charge. She was confined to her bed,

[1] Reported by J. A. McCreery, M. D., house-physician to Bellevue Hospital.

very weak and anæmic, and extremely emaciated. There was a large, hard, red, and tender swelling, with irregular but well-defined edges, occupying a large part of the hypogastric and left inguinal region, and from an opening in this swelling a very small amount of pus escaped. On vaginal examination by Dr. Barker, the uterus was found with the fundus pushed to the right side, fixed and immovable, and, to the left side of the cervix, the roof of the vagina was hard and swollen, and very tender on pressure. The tumor was ordered to be painted with iodine twice a day, immediately after which a poultice was to be applied, and quinine and iron were to be given three times a day. She was also ordered an ounce of whiskey three times a day. On the day after the examination, she complained of a throbbing pain in the part, and, on a second examination, softening was found to have begun at a little distance from the first opening. This softened spot gradually increased in size, and approached the surface, and, on November 9th, it broke, giving exit to considerable clotted blood, mixed with pus of a very offensive odor, but with no escape of gas. After this, the patient felt much relieved, and she recuperated rapidly. Her appetite returned, she gained strength, micturition and defecation became regular, and were no longer attended with pain. At the present date (November 23d) she has no pain, except in the back when she sits up too long, and she has gained very much in flesh and strength during the past week. The swelling is now less than one-third of its former size, is not so hard, nor is it very tender on pressure, and there is now no discharge from the opening. On vaginal examination, but little change can be found of the organs in the pelvic cavity, as the uterus is firmly fixed and immovable. There is, however, evidently less tumefaction, hardness, and tenderness around the cervix."

I copy from her obstetric card, which includes eight days after her confinement, the record only for the sixth, seventh, and eighth days, as, previous to the sixth day, the record exhibited a perfectly normal condition:

"*August 14th.*—Pulse 96; respiration 24; temperature 102.5°. Chills during the day, with nausea and vomiting, but no pain anywhere.

"*August 15th.*—Pulse 112; respiration 24; temperature 102.5°. Chills again, followed by nausea and vomiting. Bowels not moved for two days. Complains of a good deal of pain in passing water, but no pain at any other time. Ordered ten grains of Dover's powder, with five grains of calomel, to be taken at bedtime.

"*August 16th.*—Pulse 96; respiration 20; temperature 100°. Slept well. Bowels have moved twice. No chills, nausea, nor vomiting."

The patient assures us that she has had neither chills, nausea, nor vomiting, since she first began to suffer from the pain in her groin.

In this case there is no doubt that the dominant affection has been pelvic cellulitis; but we have also strong reason for believing that pelvic peritonitis has coexisted. The two diseases are often associated, and again one is often consecutive to the other. Now you will naturally ask, What are the symptoms and signs of each of these affections, and how are we to decide whether we have to deal with one or the other, or, if both, which predominates? It would be very desirable to give a clear and satisfactory answer to these questions; for although, as I have before remarked, the therapeutical indications in the early periods of both diseases are very much the same, yet the prognosis is infinitely more grave, in pelvic peritonitis, if the disease pass into the suppurative stage, than in cellulitis. But it is impossible to base a differential diagnosis on the symptoms, as in the early stages they are nearly identical in the two diseases. A description of symptoms, based on a preconceived theory of what they should be, from the pathological changes in the anatomical relations and physiological functions of the tissues involved, is not always verified by clinical observation, and this seems to me a mistake which authors have frequently made. Even Bernutz, to whom, more than any one else, perhaps I should say, more than all others, we are indebted for our knowledge of pelvic peritonitis, seems to me in some instances to have fallen into this error, when he attempts to give the differential diagnosis between pelvic peritonitis and

cellulitis; as, for example, when he speaks of retraction of the thigh as being common in cellulitis, but as not existing in pelvic peritonitis. Yet you will remember that this was a very marked symptom in the patient from whom I drew off, by puncture through the vaginal tumor, nearly two ounces of serum. It would be unjust, however, to omit to say that the differential diagnosis of Bernutz refers especially to non-puerperal cases of these diseases, and he expressly states that the diagnosis is very difficult in puerperal cases.

The initial symptoms of pelvic peritonitis are chills, and, subsequently, nausea and vomiting, but they are less striking than in general peritonitis. The chills are often slight, and, when the disease occurs during an epidemic of puerperal fever, in many cases they are not sufficiently distinct to be remembered by the patient, or be observed by the nurse. So also we often see cases in which there is neither nausea nor vomiting. In such, the first symptom complained of is pain in the hypogastrium, or behind the pubes, and in the pelvic cavity. The pain often radiates to the hypogastrium, the lumbar region, and the anterior part of the thighs, and is increased by abdominal pressure over the pubes, or by pressure on the tissues within the pelvic cavity in making a vaginal exploration, by the slightest effort to move the uterus, by deep inspirations, or by a cough. The fever is generally moderate, the temperature ranging from 100° to 102°, and the pulse is usually found between 92 and 108 per minute. There are generally loss of appetite, furred tongue, and constipation, and frequently painful micturition. In some severe cases, the patient finds it impossible to empty the bladder, and the catheter is required. Except in extreme cases, there is not the anxious expression of the face, the dry-

ness of the tongue, the diarrhœa, or the great depression of the vital forces, that is observed in general peritonitis.

And now let us see what are the physical signs which are found in connection with these symptoms. Following the pain and the fever, there is a puffiness or swelling at the point most sensible to pressure in the hypogastric region. As the tumefaction is chiefly within the pelvic cavity at an early period, it is not easily appreciated by abdominal palpation, for it is diffuse and not well defined. But, at a later period, it is so distinct that it becomes comparatively easy to determine its size and consistence. By vaginal exploration, the vagina is found hot, the neck of the uterus very large, usually patulous, and painful on pressure. The uterus is larger than normal for the period after delivery, and is often more or less displaced, and immovable. We generally find one or more of the vaginal *culs-de-sac* filled up and harder than usual, and sometimes all the vaginal *culs-de-sac* are filled up, and the neck of the uterus can only be distinguished by its orifice, being, as it were, buried in an indurated mass which fills the pelvic cavity. In these cases, the rectal exploration should never be neglected, as it permits examination to a higher point in the cavity than the vaginal touch, and we are thus able to ascertain the form, extent, position, and density of the abnormal tumefaction.

Thus far, neither the symptoms nor the physical signs give us any indication by which we are able to decide whether the disease be essentially an inflammation of the serous membrane, or inflammation of the connective tissue. But, in the progress of the case, the characteristics of each become more manifest, and we

are often able to form a pretty accurate judgment, either from the symptoms or the physical signs, or from a careful analysis of both, which has been the dominant affection.

According to Bernutz, the differential characteristics of the two diseases in the puerperal period are the following: (1.) The initial pain in the pelvic organs occurs at an earlier period after labor in pelvic peritonitis than in cellulitis. (2.) The disturbance in the digestive functions (nausea, vomiting, diarrhœa) exceeds in severity the febrile reaction in pelvic peritonitis, while in cellulitis the febrile reaction is more prominent than the digestive disturbance. (3.) The different characters of the two swellings.

For the last fifteen years, in my study of these cases, as I have met with them in this hospital and in private practice, I have carefully borne in mind these statements of Bernutz, and I have been forced to the conclusion that the first two are based wholly on a preconceived theory, founded on anatomical considerations, and that they are entirely valueless in actual practice. In this hospital, these cases are almost invariably consecutive to, and are often coincident with, other pelvic lesions, as metritis, phlebitis, and ovaritis, or they seem due to a moderate degree of infection from the poison of puerperal fever, and both pelvic peritonitis and cellulitis occur, as has been demonstrated by numerous autopsies, at any time during the puerperal period, while the symptoms of febrile reaction, and those arising from digestive disturbances, are governed more by the special epidemic or endemic type of the season than by the anatomical seat of the inflammation. In private practice, the facts have been somewhat different. A large majority of those that I have seen have been in

consultation with others. In very many of them, there was no evidence that the disease commenced until after the accoucheur had ceased his usual attendance, and the development of the disease was unattended with symptoms of sufficient severity to induce the patient to send for her physician, until she had suffered for some days from loss of appetite, febrile exacerbations, nervous depression, and weakness, accompanied by certain symptoms referable to the pelvic organs, as a dragging weight about the uterus, perhaps occasional lancinating or throbbing pains, and difficulty or pain in micturition or defecation. I therefore think it quite impossible to establish a differential diagnosis from the symptoms. But we are often assisted in forming an opinion "by the character of the two swellings," as Bernutz says, and by the progress of the case. The swellings within the pelvic cavity, as felt by vaginal exploration, are very much the same as regards induration and sensibility to pressure, but there is no doubt that pelvic peritonitis causes a greater degree of uterine displacement than cellulitis, and that, when the swelling can be discovered above the pubis, it carries the uterus forward, and to the healthy side, and its borders are not easily determined, either by percussion or by pressure; while the phlegmon has well-defined limits, easily marked by the sensibility and induration of the tissues involved, and often a well-marked tumor in the iliac fossa, and a projection of the abdominal walls above Poupart's ligament.

As to the duration of these affections, I may say that, when early recognized, with careful management and appropriate treatment, the symptoms in many cases disappear in a few days, and leave no trace behind. But in many others the improvement is slow, the appe-

tite continues delicate and capricious, the tongue slightly furred, and there are febrile exacerbations, especially toward the evening, and several weeks elapse before the patient recovers. Day by day, the swelling and tenderness in the hypogastrium subside, the uterus disappears behind the pubes, and by vaginal exploration it is found that the hardness and swelling in the roof of the vagina have melted away, and that the tumor around the uterus gradually grows smaller until it entirely disappears. But, in many cases there result, from the inflammatory exudation around the uterus, adhesions which leave it more or less fixed and immovable in the pelvic cavity. Dr. Matthews Duncan, in his work to which I have before alluded, has discussed the subject of adhesions more fully and more satisfactorily than any other author. My own clinical experience is fully in accord with his statement, that there are two classes of adherent and fixed uterus, characterized by the one not having distressing pain in addition to the fixation, and the other having special pain as an accompaniment. In the one, the fixation or the immobility of the uterus is the only disease in the pelvis, and this may exist for several years, the patients being in excellent health and making no complaints. But I have become cognizant of this condition by attending them when abortions have occurred, for which I could assign no other cause than the fixation of the uterus, which prevented it from rising out of the pelvic cavity as the pregnancy advanced. In the other class of adhesions, pain is more or less constant. The patient is never free from a dull sense of suffering in the vicinity of the uterus, which becomes positive pain from certain movements of the body, from defecation, and especially during menstruation, when the normal hyperæmia of the

period develops a more positive inflammatory action. In the accepted usage of medical language, it is conceded that even fibrous and osseous tissues may be the seat of a low grade of chronic inflammation, and I know of no pathological law why the walls of the non-gravid uterus should not be the seat of the same morbid process, and no philological law why we should not call this condition chronic metritis with adhesions. Some of these cases get well after the climacteric period has passed, but others do not, as my friend Professor Charles A. Budd and myself have had occasion to know by a tedious and trying experience in the treatment of one remarkable case.

Another question of great interest is, whether these adhesions be permanent. I am fully convinced that, in many cases, after a certain lapse of time, they disappear. I have known the uterus to be fixed and immovable at one period in a very considerable number of women, and have subsequently found it perfectly movable. Pregnancy seems to effect a cure in some, probably by elongation and atrophy of the adhesions. A lady in this city, five months after marriage, was severely hurt by the sudden starting of the horses when getting out of her carriage, and aborted of a three months' fœtus. Two weeks after, from imprudence, she had a severe attack of pelvic peritonitis, which in a few days became general, and came near being fatal. She remained an invalid for several months, suffering more or less from pelvic pains, and being unable to stand, except for a few moments, or to walk any distance. When she again became pregnant, she took the greatest care of herself in every particular, but again aborted at the tenth week. After convalescing from this miscarriage, her health rapidly improved, the pelvic pains

disappeared, she was able to walk long distances without suffering or fatigue, and she had very much less pain with her menstrual periods than at any former time of her life. Both her husband and herself were very anxious to have children, and two years after her last abortion I was requested to examine her for the sole purpose of ascertaining whether I could find any cause why she did not become pregnant. I found marked right lateral obliquity of the uterus, which was absolutely immovable in any direction. The strongest efforts to move the organ caused no pain, neither did the introduction of the sound, by which I found the uterus to measure two and three-quarter inches. I could find absolutely nothing the matter with her except an adherent uterus, which I thought it utterly useless to attempt to remedy. My opinion was accepted as final, both by herself and husband, but I was particularly careful not to discourage their hopes as to the future. Three years after this, that is to say, about five years after her last miscarriage, she again became pregnant, and happily went through to the end, giving birth to a living child.

When the inflammation, in these affections, passes into the suppurative stage, it is impossible to foretell how or when it will terminate. Authors seem to be agreed in stating that suppuration is a frequent termination of pelvic peritonitis and cellulitis, when occurring during the puerperal period, but, in my experience, this is very rare, except when they are associated with pyæmia or puerperal fever. It is with some diffidence that I make this assertion, apparently in contradiction to most authorities, and I may add that I am strongly inclined to the belief that this difference in experience is due to the treatment by quinine carried to its ex-

treme point of tolerance, which I have for some years adopted.

In a few cases, these diseases do not seem to be influenced by treatment. After two or three weeks' illness, the patient begins to have hectic fever, with slight irregular chills; there is entire loss of appetite, and the complexion has a leaden or often an icterode hue, all indicating that the affection has become purulent. There is a tendency for the pus to find an exit through various channels, more frequently either into the rectum or externally. The most common external discharge is in the groin, between the internal and external inguinal openings. In rarer cases, the purulent collection finds an opening by the side of the anus, or on the upper and inner part of the thigh, or in one of the labia. When the exit of pus is internal, the discharge is most frequently through the rectum. In a smaller number of cases, it takes place through the vagina, and, still more rarely, through the bladder. In some exceptional cases, the pus has opened into the peritoneal cavity.

Duncan expresses the opinion that the abscesses from cellulitis open more frequently externally than those resulting from purulent pelvic peritonitis, and Aran asserts, as his belief, that the latter very seldom find an exit through the abdominal walls. From *a priori* reasoning on anatomical grounds, I should be ready to accept this opinion, but I have seen too few autopsies of such cases to permit me to speak with any authority on this point. But Hervieux, whose opportunities must have been very large, expresses the same view so strongly as to make the mode of exit of pus a means of diagnosis between cellular abscess and peritoneal abscess. He asserts that, in cellulitis, the pus

has a tendency to burrow between the pelvic organs and find exit in fistulous canals, sometimes in the vicinity of the rectum, sometimes following the track of the sciatic nerve in one of the nates; at other times, the pus finds exit at the upper and inner part of the thigh, through the crural canal, or, accompanying the round ligament, it finds exit in one of the labia. But he asserts that, where the peritoneal abscess tends to open, it follows other channels. It either opens externally at the hypogastrium, or into some part of the intestinal canal, or into the vagina, the bladder, the uterus, or into the peritoneal cavity.

Only a very small percentage of the cases of pelvic peritonitis and cellulitis terminate fatally. In a few, the local peritonitis suddenly becomes general, and then the termination may be very doubtful. In the purulent forms of these diseases, patients may die from exhaustion, or from a general peritonitis induced by the opening of an abscess into the peritoneal cavity, and even some few instances have been reported where death has occurred suddenly from this cause without peritonitis.

In the treatment of these affections, it is necessary, in acute cases, that the patient should be kept absolutely quiet in bed. Many times have I known slight imprudences, as the patient regarded them, in getting up and moving around, to greatly intensify symptoms which had, in a great measure, been subdued by treatment, and manifestly prolong the continuance of the disease. In the next place, you should watch the condition of the bladder and the rectum. Pain in micturition is almost a constant phenomenon in these cases, and it often happens that, by reason of this pain, the patient does not half empty the bladder, as I have found by introducing

a catheter, and drawing off several ounces of extremely offensive and turbid urine, immediately after the patient had made the effort to relieve herself. While this condition continues, for obvious reasons, the catheter should be used at least twice a day. As regards the use of laxatives, I am aware that some authors have recommended that, in the early stages of acute cases, the bowels should be kept constipated. I have tried this method in contrast with the plan of keeping the bowels soluble, and I am thoroughly convinced that it is a great error to allow the fæces to accumulate in the rectum. The condition is very different from that which exists in general peritonitis, as there is no indication for arresting peristaltic action throughout the whole of the alimentary canal, and the mechanical irritation and stasis of the circulation in the pelvic cavity, produced by a distended rectum, are obviously injurious. Again, I believe that the danger from general peritonitis is greater from the use of cathartics to overcome an induced constipation, than from the frequent use of such laxatives as easily and painlessly empty the rectum. I therefore usually direct that from a teaspoonful to a tablespoonful of the compound magnesia powder be given early every alternate morning, or a teaspoonful or more of the pulv. glycyrrhizæ comp.[1] of the Prussian pharmacopœia, may be given in a wineglass of cold water at night. The patient should be kept entirely free from pain by the use of opiates. The

[1] Pulv. glycyrrhizæ comp. of the Prussian pharmacopœia:

℞. Senna-leaves,
Licorice-root, powdered, āā ℥ iij.
Fennel-seeds,
Sulphur, āā ℥ jss.
Refined sugar, ℥ ix.

M. An agreeable and efficient laxative.

amount required for this purpose is generally very moderate, as compared with what is required in general peritonitis. If the pain be very acute in the commencement of the attack, I usually overwhelm this at once by one hypodermic injection of the solution of the sulphate of morphia, and rely afterward upon rectal suppositories of opium, which should be used as often as is necessary to keep the patient perfectly comfortable. The lower part of the abdomen should be kept covered with a hot poultice of ground flaxseed, over which should be placed oil-silk, so that the poultice may retain its warmth for some hours. After the acute stage has passed, cotton-wool, wet with laudanum and also covered with oil-silk, may be substituted for the poultices. I may remark here that, for some years, I have given up, in the treatment of these cases, local depletion, either by cupping or leeching, because I have become convinced that the annoyance, trouble, and evils, resulting from these means, more than counterbalance the benefit obtained by their use. In the cases which continue beyond the acute stage, I have, for the last fifteen years, been in the habit of recommending, and have found great benefit from, what may be called internal poulticing, twice a day; that is, from the use of large vaginal injections of water as hot as can be comfortably tolerated. These may be easily managed so as not to fatigue and annoy the patient, but greatly contribute to her comfort, and, by their influence in modifying tissue, greatly accelerate resolution and absorption. The patient should lie across the bed, with the hips well over its edge, and the feet placed upon two chairs. An India-rubber sheet should be placed well under her, between her hips and her clothing, not only to prevent the latter from getting wet, but also to con-

duct the water, as it flows back from the vagina, down to a vessel which is placed on the floor. Then, by the use of a Davidson's syringe, two or three gallons or more of the hot water may be gently injected into the vagina by the nurse. A still more easy method is, to have a pail with a stopcock at the bottom, which connects with a long India-rubber tube, having a vaginal pipe at the end. This pail is placed on an elevation a few inches above the patient, and the water is allowed to run in and out of the vagina. Not only do patients generally derive great comfort from this warm poulticing, but, if the physician immediately after make a vaginal examination, he will need no argument to convince him what a powerful agent this is in modifying tissue.

At an early period in the treatment of these affections, I commence the use of quinine, giving it in as full doses as the patient can bear without inconvenience. For years past, I have often had occasion in this room to express my strong conviction as regards the anti-pyogenetic effects of this remedy, and I shall add nothing now on this point. If symptoms of suppurative cachexia and hectic fever come on, we must rely chiefly on quinine and alcohol, pushed to the point of tolerance as internal remedies, and on surgical means for giving exit to the purulent collection.

LECTURE XVIII.

PUERPERAL SEPTICÆMIA AND PYÆMIA.

Case—The effects of putridity, and its connection with some malignant fevers, some local diseases, and certain epidemics known to and well described by the older authors—The ancients studied only the resulting phenomena, and reasoned back from these to the causes—Experimental study of effects, produced by introducing putrid material into the living system, of modern date, beginning with Gaspard, in 1808—Deductions of Gaspard from his experiments—A brief history of modern researches, and the advancement of our knowledge on this subject within the past twenty-five years—Term septicæmia suggested by Piorry—Sédillot's experiments—Theory of phlebitis—Virchow's discoveries in relation to thrombosis and embolism, and their connection with suppuration—Phlebitis, pyæmia, and septicæmia, confounded together for a time—The part due to each only clearly defined within the past ten years—Chemical, microscopical, and thermometrical researches as to the nature and effects of septicæmia and pyæmia, made by many eminent men in Germany.

Septicæmia—Tendency, at the present day, to exaggerate the frequency of septicæmia, by asserting it to be the sole cause of puerperal fever, the various puerperal phlegmasiæ, and even milk-fever—Septicæmia not always traumatic in its origin—Illustrative cases—Symptoms of septicæmia—Pathological anatomy—Treatment—Reasons why it cannot be treated by elimination—Great importance of preventing the renewal and continuance of the infection—Keep the patient alive—Alcohol, quinine, food—Chlorate of potash—Tincture of the chloride of iron.

Pyæmia—Cases—Contrast of the symptoms in the case of septicæmia with the case of pyæmia—Capillary embolism discussed in connection with pyæmia—Pyæmia without traumatism—Puerperal pyæmia not a very frequent disease—Diagnosis—Prognosis—Treatment.

"Case XXXI.[1]—Margaret S——, born in Germany, aged twenty-four, married, fourth pregnancy, was brought into the hospital, February 11th, while in labor. The head had just entered the cav-

[1] Reported by Richard C. Van Wyck, M. D., house-physician to Bellevue Hospital.

ity. L. O. A. The child was born at 11 A. M., within an hour and a half after she entered the lying-in ward. The child was small—six pounds—very feeble, and died three hours after birth. The placenta, which was expelled with the same pain as the child, was unusually large, friable, and broken. A careful examination was made to see that no portion of it or of the membranes remained behind. Less blood than usual followed delivery, and the uterus contracted well. As soon as the binder was applied, the patient asked earnestly for food, and a pint of beef-tea was given to her.

"*Evening.*—The patient says that she is well. Has taken food several times with relish. Pulse 80; respiration 20; temperature 98.5°.

"*February 12th.*—Patient has slept well, except when awakened by after-pains. A few clots have come away. Pulse 84; respiration 20; temperature 99°. Passes water without difficulty.

"*Evening.*—Bowels have moved twice. Had some after-pains and a few small clots. Pulse 90; respiration 20; temperature 100°.

"*February 13th.*—Patient had a severe chill during the night. Face very red; tongue white; lochia natural; thirst; no pain or tenderness anywhere; uterus as large as the evening after delivery; breasts not swollen. Pulse 128; respiration 24; temperature 103°. 2 P. M.—Seen by Dr. Barker. Pulse 120; respiration 20; temperature 100.5°. Ordered quin. sulph., gr. v, at once, gr. x, at bedtime. Vaginal injections of carbolic acid.

"*Evening.*—Pulse 130; respiration 32; temperature 104.5°. From this time, until the death of the patient, she was seen by myself or my assistant, and the symptoms noted, every hour. During the night, she was often delirious, and she also had four passages from the bowels.

"*February 14th*, 9 A. M.—Pulse 132; respiration 22; temperature 104.5°. Quin. sulph., gr. v, every sixth hour. 2 P. M.—Pulse 128; respiration 32; temperature 103°. Tongue dry, with a brown streak in the centre. No pain anywhere, and bears strong pressure over and all round the uterus. Lochia rather scanty, with no odor perceptible, even when examined before the injections are given. Eyes wandering. Answers questions, sometimes rationally and sometimes wildly. Whiskey, ℥ ss, every hour. 7 P. M.—Pulse 152; respiration 36; temperature 104.3°. Countenance sunken and bedewed with perspiration. Hands and lips trembling. Has had two involuntary stools in bed. Bismuth. subcarb., gr. xv, with five grains of Tully's powder. To be repeated in the night, should the

diarrhœa continue. During the night, she slept very little, was very wild, and often got out of bed before she could be stopped.

"*February 15th*, 9 A. M.—Pulse 140; respiration 36; temperature 104.5°. Countenance sunken and leaden. She has had but two passages. Vomited a little several times. Positively refuses to take whiskey, quinine, or any thing else in her mouth. Bronchial *râles* over the entire chest. Urine has several times been examined for albumen with negative results. 2 P. M.—Very tranquil, and has had very little delirium since three o'clock this morning. Diarrhœa has stopped. Abdomen tympanitic, but no tenderness anywhere. Pulse 152; respiration 28; temperature 99°. 7 P. M.—Pulse, very feeble, 164; respiration 52; temperature 97.5°. General surface cold and moist. Abdomen enormously distended. Died at 11½ P. M.

"*Autopsy, February 16th*, 3 P. M.—Brain normal. Thorax, pleura, and pericardium normal. Heart, right auricle and ventricle, contained some dark clots. Lungs congested at the base, but perfectly normal in other respects. Abdomen: intestines greatly distended with gas. Peritoneal cavity did not contain a half-ounce of serum, and not a trace of inflammation anywhere on the surface, except some very small patches of soft, false membrane over both ovaries. The veins of the broad ligaments were swollen, with dark, soft coagula. Uterus, seven and a half inches in length, five inches in breadth. The internal surface of the uterus was covered with a sanious coat, which was easily washed off. At the placental seat, were some adherent putrescent *débris* of the placental tissue. Incision through every part of the uterine tissue disclosed only one vessel filled with pus, which opened into a little abscess not larger than a pea. Everywhere else the tissue of the uterus was perfectly healthy. Ovaries: the usual appearances at this period after delivery. Liver normal. Spleen, decidedly larger than usual and more friable. Kidneys normal."

Gentlemen: Physicians in all ages of the past have been aware of the fact that the introduction into the living system, of the organic elements of animal tissue, decomposed by putrefaction, produced hemorrhagic infiltration, degeneration and disorganization of parenchymatous organs, softening and mortification, stupor,

debility, and that aggregation of symptoms which we now include under the term typhoid. And so, when these conditions were recognized as occurring in fevers, in the puerperal state, and in surgical affections, the terms used by the older authors to describe them were putrid fever, putrid infection, and putrid resorption. The phenomena of these affections were studied with great care, and their relations with the medical constitution of the individuals affected with a peculiar class of diseases, and with epidemic and atmospheric influences, were most thoroughly investigated and described, with an accuracy and fidelity which have not been surpassed by any modern observers. The works of the illustrious Sydenham, the essays of Pringle, "On the Diseases of Armies in Camps and in Garrisons," and "On Fevers in Hospitals and in Prisons," and his experiments on septics and antiseptics, or the remarkable treatise of Huxham on fevers, might be studied with great advantage by some of the most recent writers on septicæmia. You will find many of the arguments which are now urged in support of the doctrine that puerperal fever, with its varied and numerous lesions, originates exclusively from the absorption of septic material into the system, have been urged with quite as much force and logical power by those great minds of former days, to demonstrate that the phenomena of various forms of malignant fevers, and many local diseases which induce disorganization and death of tissue, were due to putrid infection. I do not mean to say that there is not a great deal of truth in the doctrines advanced, both by the writers of a former day and those of the present time, but I shall try to point out to you wherein errors have resulted from exclusive and restricted views.

There is, however, one great and radical difference between the study of this subject in former times and at the present day. Our predecessors studied exclusively the phenomena resulting from what they believed to be the cause, and all reasoning as to causes was reasoning back from effects. It is only within the last half-century that an experimental and philosophical study of the causes has begun. I think it doubtful whether one of you have ever heard of the name of Gaspard, a physician in St.-Etienne, a small town in France, who, in my estimation, deserves to be ranked among the great names of those who have made positive discoveries in medical science, as he first inaugurated those experimental inquiries which, I may say, have established the causes of septicæmia. The labors of others more recently, in this field, have only developed and demonstrated what Gaspard had previously advanced. He began his experiments in 1808, and his first essay on the subject was published in 1809. But his most important essays were published in Magendie's *Journal de physiologie*, the first in 1822, under the title "Mémoire physiologique sur les maladies purulentes et putrides, etc.;" the second in 1824, "Second mémoire physiologique et médical sur les maladies putrides." In these essays, he gives the details of his experiments made by injecting the natural, diseased, and decomposed animal fluids into the veins of animals. From these experiments, he deduced the following conclusions:

(1.) That pus introduced into the blood-vessels, in a small quantity, can circulate through the system without causing death; provided, however, that, after having caused a good deal of disturbance in the system, it be expelled by some critical excretion, chiefly by the urine or the fæces.

(2.) But that, introduced several times successively in small quantities, it ends by destroying life.

(3.) That this result is obtained much more quickly if a large dose be at once introduced into the veins, and that then it causes different grave inflammations, as pneumonia, carditis, dysentery, etc.

(4.) That it is susceptible of being absorbed, but it then causes inflammation of the serous membranes, and of the cellular tissue with which it comes in contact.

(5.) That most of the symptoms which are observed in slow fevers or consumptions, seem to have relation to pus in the system, since in all these cases there is profuse suppuration, with general disturbance of the secretions.

Gaspard also made several experiments by the injection of putrid pus, and found the general result to be a peculiar inflammation, accompanied by a kind of passive hemorrhage from the mucous membrane of the intestinal canal. He also endeavored to ascertain which of the chemical constituents of putrilage—the carbonic acid, the hydrogen, the sulphur, or the ammonia—produced the poisonous effects. He then enumerates all the diseases in which he had observed putridity, which he divides into three classes, based on the following causes :

(1.) A peculiar putrid diathesis, which is spontaneous, individual, and constitutional, and in this class he includes the condition of the system resulting from starvation, from scurvy, from malignant pustule, from carbuncle, and adynamic fever not due to any known cause, except an individual diathesis with a spontaneous tendency to putrefaction.

(2.) Absorption of putrid substances, in which he classed every variety of typhus, the putrid fever of

villages, putrid dysenteries, the malignant fevers with putrid symptoms caused by the effluvia from marshes.

(3.) Atmospheric heat, which tends to produce putrefaction in the animal economy; and in this class he includes the plague, yellow fever, cholera, some typhus fevers, and all the diseases which are found only in hot climates, in the torrid zone, between the two tropics.

I have given you this brief abstract of the experiments and deductions of Gaspard, made fifty years ago, because his name is seldom mentioned now, while others, who have recently simply worked out the details of what he so comprehensively grasped, have justly become famous.

Soon after the time of Gaspard, the character and symptoms of putrid and purulent infection began to be studied more closely. But, with most medical and surgical writers, the distinction was not made between the symptoms caused by putrid infection, and those resulting from pus in the blood, and the latter received by far the greater share of attention. It would be most interesting to trace, step by step, the progressive advance in our knowledge of these pathological conditions during the past thirty-five years. We should find that we owe much to the study of the physiology and pathology of the blood, by Magendie, Andral and Gavarret, and other hematologists, who have come after them, as Becquerel and Rodier, and Robin and Verdeil. Then, how much we owe to the pathologists, chief among whom I should mention Piorry and Bouillaud! The former gave the appropriate name of septicæmia to the disease resulting from the absorption of septic material, and both he and Bouillaud clearly and fully described the disease, in its acute, and in its

chronic, in its sporadic, and in its epidemic forms. Nor should I omit the names of Bérard and Sédillot. The former, in a celebrated article on pus, in the *Dictionnaire de médecine*, gave the most comprehensive account of the phenomena of purulent and putrid infection which had yet appeared, although he ascribed these phenomena chiefly to the influence of the pus in the blood. Sédillot, in 1849, published the results of a great variety of experiments made by the injection of healthy pus, of putrid pus, and of filtered putrid serum, inducing thereby all the forms of purulent and putrid infection, including what has been termed metastatic abscess and putrid gangrene. Indeed, he seems to have anticipated most of the leading ideas on this subject, which have been established at the present day.

But obstetrical pathologists had already begun to call attention to the pathology of the veins, and, for a series of years, phlebitis was studied so exclusively as to bury, as it were, the knowledge previously acquired in regard to the blood-changes. And thus we see how it came to pass that, for a time, phlebitis, pyæmia, and septicæmia, were inextricably confounded together. Thus, by many eminent writers, the mixture of pus with the blood was regarded as the essential cause of the phenomena which were studied; phlebitis was the primary inflammation which resulted in the purulent infection; and septicæmia was an accidental complication. In proof of this assertion, I could refer you to numerous obstetrical authors, prominent among whom I might mention Dance, Tonnellé, Béhier, Robert Lee, and our American obstetrician, Meigs. In the work of the latter, "On Child-bed Fevers," published in 1854, it is amusing to see with what enthusiasm he ad

vocates this doctrine, boldly asserting that all the blood-changes are a consequence of inflammation of the lining membrane of the veins, "the endangium," and how he sneers at and ridicules the doctrine of primary blood-vitiation.

But this phlebitic pathology was not accepted by others of equally high authority, as you will see by referring to the writings of Paul Dubois, Danyau, Kiwisch, Rigby, and especially to the classical work of Robert Ferguson, "On Puerperal Fever," and many other authors whom I might mention, that the blood-vitiation, putrid infection, or, as we should now say, septicæmia, was regarded by them as the primary cause of the phenomena that we are now studying.

But, until within the last ten years, there was not any well-defined distinction made, so as to determine what part of the phenomena in question was due to pus in the blood, what part to putrid infection of the blood, and what part to phlebitis.

Let us now briefly examine the different steps by which this result has been obtained. In 1846, Virchow repeated the experiments of Gaspard, and adopted the term septicæmia, which had been suggested by Piorry. Next in order of precedence, both as regards time and importance, I should mention the researches and discoveries of Virchow, in regard to thrombosis and embolism, and their relations to phlebitis, to infarctus, to suppuration, and purulent infection. I should not omit the zealous and conscientious study of phlebitis, and its connection with purulent infection, by Béhier. Then the chemical properties of the putrid poison were studied by Blum, Bergmann, Panum, Stich, and others, and many important points have been settled by their combined investigations. The aid of the microscope

was invoked to clear up other obscurities connected with these subjects. It seems to be settled that coagulation and the subsequent suppurative degeneration of the clots are not an effect of phlebitis, but are often a cause of this lesion. By microscopy it was demonstrated that the pus-corpuscles and the white corpuscles of the blood are identical, and both are now called leucocytes. But, as excess of leucocytes constitutes, so far as at present is known, the essential morbid condition of the disease known as leucocythæmia, which is characterized by phenomena entirely different from those belonging to pyæmia, it is certain that the essential morbid condition of the latter cannot be due to an excess of leucocytes, but that some other toxic element belonging to pus causes these phenomena. And so, by the microscopical researches of Tigri, Davaine, Leplat and Jaillard, Burdon-Sanderson, Coze and Feltz, and others, the infusoria called bacteria were discovered and found to be a constituent of septicæmic blood, and thus we have been furnished with another element of distinction between septicæmia and pyæmia. These bacteria, however, seem to be a product of changes effected in the blood by septic poisoning, rather than a cause of the morbid phenomena which appear in septicæmia, for the experiments of Bergmann and others have demonstrated that, when these bacteria are alone introduced into the blood, they give rise to none of these phenomena, and are absolutely innocuous.

Billroth and Weber followed Virchow in the experimental study of putrid and purulent infection, but, in addition, they, as well as Griesinger, Otto, Roser, Blum, Stromeyer, Pirogoff, and others, have carefully analyzed and described the clinical phenomena of these affections, and particularly their essential characteristic,

the fever, which, by the aid of the thermometer, is measured and described, as to its periods of development and subsidence, in all its gradations.

In this brief and very imperfect history, in which I have doubtless omitted many names equally worthy of mention, you see how, by the combined and accumulated researches of many, we have arrived at our present state of knowledge on these subjects. Very much yet remains to be found out, but it is now clearly established that septicæmia, pyæmia, and phlebitis, are entirely distinct diseases, although it must not be forgotten that either of the two, or, indeed, that all the three, may be coincident in the same patient. I must refer you to an excellent paper by Dr. Mary C. Putnam, which was first read before the "Medical Library and Journal Association," and subsequently published in the April number (1872) of *The Medical Record*, of this city, for a concise and careful summary of our present knowledge of these affections. My discussion of them must be here restricted to their puerperal relations.

At the present day, septicæmia seems to have taken full possession of the medical mind, and, in my judgment, here, as in numerous other instances in medical history, there is a tendency to exaggerate its frequency and its importance. Thus, some, to whom I shall refer hereafter, regard puerperal fever as being exclusively due to traumatic lesions, and the absorption of septic material at the surface of these lesions. Others, again, seem to consider metritis, lymphangeitis, phlebitis, peritonitis, in fact, all the puerperal phlegmasiæ, as results only of septicæmia, entirely ignoring all the other known causes which induce inflammation during the puerperal period. Others, again, among whom I may mention Hecker, Winckel, Grünewaldt, and D'Espine,

have entirely abolished milk-fever, and see, in the febrile disturbances which sometimes appear when the function of lactation is being developed, only evidence that the system has absorbed a small dose of septic poison. Still, we find in actual practice that this so-called form of septicæmia is easily and rapidly cured by relieving the congestion of the mammary glands, and establishing, by appropriate means, a free flow of milk through the lacteal ducts.

The conditions of the puerperal state would seem eminently favorable for the development of septicæmia. There are the traumatic lesions of the placental disk, of the os tincæ, and of the vulva, which occur in some degree in every labor. There are the thrombi, which often, according to Robin, block up the uterine sinuses at the placental surface, and the blood-clots, often retained in the uterine and vaginal cavities for a sufficient period to decompose and degenerate into septic material. But how many hundreds of women go through this period without the slightest evidence that the system has been disturbed by septic infection, where one exhibits the phenomena of this disease! We find one explanation of this exemption in the fact, first signalized, I think, by Billroth, that septic poison is not absorbed by the surface of wounds, after the granulating process has commenced and the surface is covered with pus. We have reason to believe, therefore, that this process protects the system, after sufficient time has elapsed for the blood-clots to decompose and form septic material. Any condition of the system which interferes with the healthy granulation of traumatic surfaces, must therefore favor the tendency to the development of septicæmia.

The miasm of hospitals, the poison of puerperal

fever, of erysipelas, of typhus and of scarlet fevers, and various epidemic influences, may thus act, not only as predisposing causes of septicæmia, but they may also develop an idiopathic or non-traumatic septicæmia, as, indeed, may all diseases which are liable to terminate in sloughing or gangrene. Hence we see that this disease does not arise exclusively from the absorption of septic material from without, but the septic matter may be formed within the system by those morbid processes which result in disorganization and death of tissue, to which Virchow has applied the term *necrobiosis*.

And here I shall remark that I feel quite confident that Schroeder and several other writers are in error, when they assert, in substance, that the mother cannot be infected by a dead fœtus, if the access of air have been prevented, that is, if the membranes have not been ruptured and the waters discharged. I shall briefly refer to two cases—and I have seen others—in which the symptoms seem to prove conclusively that this event did occur.

One patient was the wife of a physician in this city, who, about the seventh month of her first pregnancy, having previously been in good health, began rapidly to lose strength. Then she became dull and disposed to sleep, but complained of no pain. There were some fever and moderate thirst, although she drank but little, as the stomach rejected every thing almost as soon as swallowed. She had also diarrhœa, the discharges being fluid and very offensive. My friend, Professor Charles A. Budd, then saw her with others, and recommended that labor should be brought on at once; but, unfortunately, as I think, he was overruled by the voice of the others with whom he was in consultation. Four days after this, I saw her for the first time. She was then almost

unconscious, her countenance was very much sunken, and the complexion was of a very peculiar icterode and leaden hue. Her pulse was very rapid and feeble, the skin dry, and the extremities were cold. Four hours after my visit, the membranes ruptured while she was vomiting; there was a very large discharge of most offensive waters, and I was again asked to see her. In less than an hour after the membranes had ruptured, with very slight manifestations of labor, she was delivered of a putrid fœtus, and she died a few hours after.

My second case was that of a lady, who, while on a visit to Richmond, Va., in the seventh month of her second pregnancy, received a great shock from seeing the bodies of some who had been fatally injured by a catastrophe which occurred in a public building. From this time she never felt the slightest motion of the child. I saw her about three weeks after this event. She then looked so very ill as to alarm me extremely. Her pulse was rapid and feeble, and she told me that she had been unable to take food for some days, as she vomited every thing taken. She was then up, but I directed her to go to bed at once, to apply sinapisms to the epigastrium, and to take a tablespoonful of milk-punch every few minutes. I also ordered fifteen grains of the sulphate of quinine, in two powders, one to be taken at once, and the other in the evening. On visiting her in the evening, I found that the first powder of quinine had been retained, and that, for a few times, the milk-punch had been grateful, but after a while free vomiting had come on, and from this time she was unable to keep any thing on the stomach. The pulse was 120 and very feeble, and the temperature, 104.5°. On auscultation, neither the *bruit de souffle* nor the

sounds of the fœtal heart could be heard. The surface of the abdomen, over the uterus, was cold, in marked contrast to the contact of the hand on contiguous parts. I obtained a specimen of the urine, which, on subsequent examination by Professor Austin Flint, Jr., was found to contain neither albumen nor casts. I then determined to rupture the membranes, which was very easily done by the finger alone, when a very large discharge of waters took place, with such an overwhelmingly offensive odor that I was compelled to rush precipitately to an adjoining room. She had very little labor-pain, but, two hours after, a putrid fœtus was expelled. There was no blood discharged with the placenta, which was very much broken down by degeneration and extremely fetid, so that, in spite of repeated washings with a solution of the permanganate of potash and with carbolic acid, the odor seemed to cling to my fingers for several days. This, however, was probably only the memory of the vivid impression which the odor first made. I had the vagina well washed out by carbolic-acid injections, and these were often repeated. After the delivery of the fœtus, there were for some hours less vomiting and diarrhœa. The patient was disposed to doze, but at the same time was very restless. From this time until her death, three days after, I was assisted by the valuable aid and advice of my friend, Professor T. M. Markoe. We endeavored to support and keep our patient alive by nutritious, stimulating, and tonic enemata, which she generally retained well, and by inhalations of oxygen. But the vomiting was frequent, the fluid ejected being sometimes of a grass-green color, and at other times of a coffee-ground appearance. The occasional discharges from the bowels were excessively offensive. The mind was wandering, though not active-

ly delirious, and sometimes there would be almost a comatose stupor.

I do not see how one can resist the conviction that this was a case of septicæmia developed by a dead fœtus, which had not been exposed to the air. Although little was known of septicæmia, as it is at present understood, at the time when Kiwisch died, yet he gives cases resembling in their general character those which I have just described, which he ascribed to "blood-dissolution." I have no doubt that a careful search of medical literature, and the experience of the profession, could furnish many illustrations of a similar kind.[1]

There are two sources of infection: one within the individual, or auto-infection, absorption taking place of septic material, resulting from the retention and decomposition of blood-clots, or from tissues which have by disease terminated in necrobiosis; the other, hetero-infection, the poison coming from without, the septic materials being absorbed by the surface of a recent wound, either by direct contact or from particles in the air. From what I have before said, you will infer that I do not believe that traumatism is a necessary antecedent of auto-infection. Whether this be the case or not for hetero-infection, is not yet determined, because it has not yet been demonstrated, so far as I am aware, that the septic material can enter the system through the medium of the respiratory mucous membrane.

The symptoms of septicæmia will vary according to

[1] *Vide* report of a very interesting case of the same kind, in "An Account of the Recent Epidemic of Puerperal Fever as it appeared in the Dublin Lying-in Hospital," by Alfred H. McClintock, M. D., M. R. I. A., Master of the Hospital. Published in the Dublin *Quarterly Journal of Medical Science*, May, 1855. Also a case published by Mr. McWhinnie, in the Medico-Chirurgical Transactions, vol. xxxi., page 65.

the amount of the poison absorbed and the consequent intensity of the disease. It may be so intense as to destroy life in a few days, or so mild as only to excite a moderate degree of fever for a few days, and then all disturbance of the system disappears. In other cases, the symptoms may continue for days or weeks, and then terminate in either recovery or death. A question of great interest is, What is the cause of this fever—this rise of temperature, which the thermometer proves always to occur in septicæmia? The most ingenious and most probable explanation which has been given is, that it is due to the chemical changes produced by the poison, to an acceleration of the molecular metamorphosis of the blood and tissues.

It is said that this disease has been rarely ushered in by a chill, but you observe that it was the case with our patient. There was, however, no recurrence of chills, and it is alleged that this is never the case in pure septicæmia, and it is asserted by some that, when the chills are repeated, it is an evidence that the septicæmia is complicated with pyæmia. But the elevation of temperature, as shown by the thermometer, is a constant phenomenon, and measures, to a certain extent, the intensity of the poison. It ranges from 100° up to 106° or even 107°. But another point to be remembered is, that the fall of temperature does not indicate, apart from the other symptoms, a corresponding decline of the disease. It often happens that, as the case approaches a fatal termination, a rapid fall of temperature is noted, as was the fact with the patient whose history has been given you. Another curious fact has been mentioned by some writers, that, immediately after death, there is for a few moments a marked rise of temperature. I have repeatedly called the attention of

the members of my staff to this point, but no instance of the kind has as yet been reported to me. Pain is not a characteristic of this disease, which, on the other hand, seems to deaden the morbid sensibilities of other diseases when associated with it, as I have often noticed, particularly as regards peritonitis and metritis. Indeed, one of the striking peculiarities of septicæmia is its effect on the nervous system. Patients do not generally suffer much, but they are dull, heavy, and sleepy, and sometimes almost comatose. There is usually more or less wandering delirium, but very rarely a high degree of maniacal excitement. Diarrhœa is a very frequent symptom, and it is sometimes very profuse. Vomiting always occurs in the severe, but is frequently absent in mild cases. There is thirst, and the tongue is generally dry, but the patients are too apathetic to call for drink. Perspirations are common and are sometimes profuse in the beginning of the disease, but usually the skin is dry and flabby in the later stages.

Now, this group of symptoms, more or less pronounced, according to the amount of poison absorbed, is accepted as being characteristic of septicæmia, and they coincide with those which are produced in the inferior animals by the injection of septic material into the veins. But, in actual obstetric practice, we meet with few cases of pure, uncomplicated septicæmia, for it is usually associated with other affections, as puerperal fever, or phlebitis, metritis, peritonitis, or other of the puerperal phlegmasiæ. We therefore more commonly find the symptoms of septicæmia combined with, sometimes masking, or at other times overshadowed by, those of some associated disease.

The autopsical lesions of this affection are principally

a dark, fluid condition of the blood, and a softened, congested state of the visceral organs. The mucous membrane of the intestinal canal is generally softened and swollen with that kind of dark-purple hyperæmia which results from congestion of the venous radicles. There are neither the thrombi, nor the phlebitis, nor the metastatic abscesses, which are found so often with pyæmia.

As to the treatment of septicæmia, I would first observe that the idea of elimination of the toxic elements through the various channels of the intestinal canal, the kidneys, and the skin, would naturally suggest itself. But I am convinced that little can be effected by these means, for, in the first place, the disease is the consequence of the poison which has already produced its effects. I think that the point is often overlooked in medicine, that when treatment of disease is needed, the time for removing causes has already gone by. It is the results which we are to counteract by our therapeutic resources. Now, the results of septicæmia are such a condition of the blood as necessarily involves ataxia, and hence would forbid the use of any agents which have a tendency to enfeeble the vital powers; and such a condition of the visceral organs and of the mucous membrane of the intestinal canal as would render them intolerant of the irritation necessary to stimulate increased excretion. Indeed, I think that we have reason to believe that the tumefied, softened condition of the intestinal mucous membrane is the consequence of the effort of the system to eliminate the poison through this channel.

It is of the greatest importance that every safe measure should be used to prevent the continuance and renewal of the infection; and the danger from this is very great in puerperal patients. Vaginal antiseptic in-

jections (and probably the carbolic acid is quite as good as any other for this purpose) should be thoroughly used two or three times a day. The necessity and propriety of intra-uterine injections should be carefully weighed and a decision made, based on the considerations which I have alluded to, when discussing their use in endometritis. I should certainly not hesitate to recommend them, if the history of the case and the symptoms indicate that the septicæmia was the consequence of, or was complicated with, endometritis.

Our measures for preventing the renewal and continuance of the infection should not stop with merely giving directions for antiseptic injections. I often think that success in treating very grave diseases is frequently secured by minute attention to details, and in this disease, you cannot be too particular in directing that the lochial guards should be often changed, and that they should be soaked after removal in a solution of carbolic acid, that the sponge or linen used in washing should always be washed in this solution, and that the clothing and bed-linen should be changed every day (with great care not to fatigue the patient by the process), and these also should be washed with the disinfectant, and that the apartment should be kept well ventilated.

The chief indication is to sustain the vital powers; or, in other words, to keep the patient alive while the system is making an effort to get rid of the poison and to recover from its effects. The fever rapidly exhausts and wears out the patient, and so it is obvious that it must be allayed by means which do not enfeeble her. Experience seems to prove that quinine is the most efficient agent for this purpose. In proportion to the gravity of the case, from five to ten grains may be given in the morning, and from ten to fifteen or twenty grains,

in the evening. I have often observed a decided fall of temperature, as shown by the thermometer, after a full dose of quinine.

I shall here remark, because I think this is a point often misunderstood, that this is not a disease to be treated by an arterial sedative, such as the veratrum viride. The tendency of septicæmia is to dyscrasia, not to inflammation. Veratrum viride does not reduce the rapid pulse of exhaustion, but the quick, hard pulse of inflammation. Professional friends have frequently spoken to me of their disappointment in the use of this drug, which I am convinced has often arisen from a failure to recognize this distinction.

The influence of food and alcohol in lowering temperature is now much better understood than in former times. As I have before discussed these effects in connection with other topics, I shall only say here that septicæmia is eminently a disease which demands all the nutritious food that can be easily assimilated, and alcohol in as full doses as will be tolerated. The alcohol does not excite increased cardiac action, but, moderating excessive action, the heart appears to contract more vigorously, and thus, by driving the blood through the impeded capillaries, it relieves the congestion of the venous radicles, which is so characteristic of this affection.

Agents which improve the hematosin, are obviously indicated; and I have made large use of the chlorate of potash and the tincture of the chloride of iron in the treatment of septicæmia. I am thoroughly convinced of the value of the former, having repeatedly observed a favorable change very soon after commencing its use. In grave cases, I give from fifteen to twenty grains every third hour. It is easily taken and readily absorbed, if the stomach be in a condition

to absorb any thing. As regards the tincture of the chloride of iron, my experience has led me to believe that it is often very serviceable in the convalescence from septicæmia, but that it is not well tolerated during the active stages of the disease, as the stomach is apt to reject it.

I shall only add, that the treatment of septicæmia must be greatly modified and controlled by the complications with which it may be associated. In many cases, it is to the complications chiefly that we must address our therapeutic measures.

Let me now call your attention to another form of disease, which I think is quite distinct from septicæmia, although the two affections were long confounded. Three weeks ago, I brought before you several cases of mammary abscess, and you will remember one which had a very peculiar and interesting history. I then remarked that I should take an early opportunity to discuss the subject of pyæmia. I shall briefly recapitulate the main points in the history of this case. The girl had been delivered of her first child, six weeks before you saw her. The labor was normal, and her obstetric card shows that every thing went on favorably until the fifth day. Then she had a chill, with severe pain in the hypogastrium; her pulse was 112; her temperature 102°, and she appeared to have a sharp attack of metro-peritonitis. But these symptoms had all disappeared on the eighth day after confinement. Two days after this, she again had a chill and complained of pain in the left knee, and during the night this became much swollen. The swelling continued and was very painful for three days, and then disappeared as rapidly as it came. But she had no appetite, and the temperature remained high, varying

from 101° to 104°. The day after the swelling left the knee, the left submaxillary glands began to enlarge, and the swelling extended over the whole side of the face to such an extent that, for one day, it was impossible to get even liquids into the mouth. As this disappeared, the same process of enlargement of the submaxillary glands was repeated on the right side of the face. This also disappeared after a few days, without suppuration. Next the breasts became the seat of swelling, first the left, which rapidly went on to suppuration, and then the same occurred in the right. The quantity of pus which had been discharged was absolutely enormous. When she was brought before you, which was also the first time that I had seen her, she appeared to be decidedly improving. She was reported to be gaining in flesh and strength; there was then very little discharge from the abscess; the breasts were not much enlarged, and she was taking milk, eggs, beef-soup, and porter, in abundance. But I regret to say that, a a few days afterward, pulmonary symptoms began to manifest themselves, and at present, I regard her condition as very unpromising.[1]

Dr. Van Wyck will now read the report of another patient, who has recently died in my service.

"Case XXXII.[2]—Bridget B——, aged thirty years, single, primipara, labor commenced 8 P. M., February 2d. First stage, nine hours; second stage, four and a half hours; third stage, fifteen minutes. Vertex. L. O. A. Boy, weight, eight and a half pounds.

[1] This patient died five weeks after the time of this lecture, but her friends would not permit an autopsy. During the whole time that she was in the hospital, her moral state was very depressing, as she was extremely unhappy and despondent on account of her seduction. She only permitted her friends to know where she was, on the day before her death.

[2] Reported by R. C. Van Wyck, M. D., house-physician to Bellevue Hospital.

"*Feb.* 3.—10 A. M., respiration 21, pulse 72, temperature 98°.
" 4 " " 22, " 70, " 99°.
" 5 " " 22, " 84, " 100°.
" 6 " " 20, " 84, " 100°.
" 7 " " 20, " 96, " 99.5°.
" 8 " " 18, " 84, " 99°.
" 9 " " 20, " 84, " 102°.
" " 2 P. M., " 20, " 116, " 104.5°.
" " 8 P. M., " 22, " 112, " 102°.

"Patient had a chill just after morning visit. Complains of no pain, but appears very restless.

"*Feb.* 10.—10 A. M., respiration 22, pulse 108, temperature 102.5°.
" 2 P. M., " 22, " 112, " 103.5°.
" 8 P. M., " 22, " 108, " 101.5°.

"Quinine, grs. v, every sixth hour.

"Had another chill to-day at noon. On the inner aspect of left leg, there was discovered a hard, circumscribed tumor, exactly over the internal saphenous vein. The vein above the tumor was enlarged and varicose. She complains of difficulty in moving the leg, but not of pain in the tumor. Urine scanty and quite thick. On examination, it was found alkaline, and contained pus, blood-corpuscles, and mucus. Dry cups over both kidneys. Continue quinine. Potass. citrat., ʒ ss, in syrup and water, every fourth hour.

"*Feb.* 11.—Respiration 22, pulse 108, temperature 102.5°.
" 5 P. M. " 24, " 116, " 103.5°.

"Had a slight chill to-day, followed by profuse perspiration. Says her leg is better, and the tumor is decidedly smaller.

"*Feb.* 12.—Respiration 20, pulse 100, temperature 99.5°.

"Patient says that she is quite well, and wishes to get up.

"*Feb.* 13.—9 A. M., respiration 24, pulse 116, temperature 104.°
" 3 P. M., " 24, " 112, " 103.°
" 8 P. M., " 22, " 112, " 101.5°.

"Had chills again this morning. Did not sleep well. Has no appetite, and feels weak. Not much thirst. Countenance anxious, and patient asks if she is going to die. Left wrist a good deal swollen, but has no pain except when moving it.

"*Feb.* 14.—Respiration 34, pulse 108, temperature 102°.
" Evening, " 34, " 112, " 100.5°.

"Has had no chill to-day. Feels much better, and has a good appetite. Bowels, which have before been regular, moved twice to-day.

"*Feb.* 15.—Respiration 32, pulse 112, temperature 103°.

" Evening, " 34, " 108, " 102°.

"No chills, but sweats profusely. Right shoulder swollen and painful. Was kept awake last night by the pain in it. To have two teaspoonfuls of solution of morphia (U. S. P.) at bedtime. Has been troubled by cough all day, which causes pain in the shoulder. No expectoration.

"*Feb.* 16.—Respiration 38, pulse 120, temperature 103.5°.

" Evening, " 42, " 124, " 104°.

"Again had a chill. No pain except in the right shoulder. Coughs a good deal, with expectoration of bloody, frothy mucus. *Râles* abundant in both lungs. No dullness on percussion. Mind clear. No nausea or diarrhœa. Eight dry cups were applied between the shoulders, which greatly relieved the cough. The quinine is continued. The carbonate of ammonia, gr. iij, is substituted for the citrate of potash, every second hour. Also to have whiskey, a half-ounce every second hour.

"*Feb.* 17.—Respiration 32, pulse 136, temperature 103.5°.

" Evening, " 36, " 148, " 103.5°.

"Countenance sunken, skin yellowish. Complains of difficulty of breathing. *Râles* louder and more abundant.

"*Feb.* 18.—Respiration 48, pulse 158, temperature 105.5°.

"Face bathed with a cold sweat. Breathing very labored. Has had no expectoration since last evening. Died at 2 P. M.

"*Autopsy, Twenty-five Hours after Death.*—Rigor mortis had disappeared. Heart normal, except in the right cavities, where there were fibrinous clots. Pleura normal. Both lungs were deeply congested, more especially the lower lobes, and in the right lung there were several small abscesses, from the size of a pea to that of a filbert. In the lower lobe of the left, there were no abscesses, but several points of apoplectic extravasation. There was no appearance of peritonitis or effusion in the peritoneal cavity. Liver normal. Spleen much larger and softer than usual. Left kidney larger than the right, and its cortical portion seemed softer. Uterus firmly contracted down, and incisions being carefully made through every part, no pus was found in the sinuses or in the uterine walls. In the right ovary, there was a small, unopened abscess. The bladder was quite contracted, and its mucous membrane was thickened and softened. On opening the articular cavity of the right shoulder, nearly two ounces of a purulent fluid escaped. The left saphenous vein was enlarged, and contained a firm clot nearly an inch in

length, but no pus. The lining membrane of the vein seemed healthy. There was extensive cellulitis around the vein, extending above the knee, but no suppuration. Careful examination was made for clots in other veins, but none were found."

Now, let us briefly contrast this case with the one the history of which was read at the commencement of this lecture. In the first case, there was but one chill, which occurred on the second day after delivery, and, I may here observe, that frequently, in septicæmia, no chill is noted. In the latter case, a chill first occurred on the seventh day after delivery, and then again on the eighth, ninth, eleventh, thirteenth, and fourteenth days. I believe that chills always occur in pyæmia, and are repeated at irregular intervals; sometimes in ten or twelve hours, but more generally the period is from twenty-four to forty-eight hours. They vary in degree, from a slight, tremulous, and cold sensation, to a violent shaking of the whole body, and last from a few minutes to a half-hour, or even a longer period. In the first case, there was marked cerebral disturbance. The patient became delirious the first evening of the attack, and the mind was disturbed throughout the whole course of the disease. In the latter case, there was never delirium, and the intellect of the patient remained clear to the end. In pyæmia, we never meet with the wild delirium, the mania, which often occurs in septicæmia, but brain-power seems to be exhausted, the patient becomes incoherent, stupid, and incapable of thought or expression. Diarrhœa was a very prominent symptom in the first case, as it almost invariably is in septicæmia, but it did not occur in the latter, nor is it a characteristic symptom of pyæmia. In the first case, the patient was attacked with the disease on the second day after delivery, and died on the fifth day. In the latter case, the initial symp-

tom of the disease occurred on the seventh day, and she died on the sixteenth day after delivery.

I believe that septicæmia generally commences at an earlier period after delivery, and, when fatal, the disease is of much shorter duration than pyæmia. The latter affection rarely begins in the first week of the puerperal period, and the most rapidly fatal cases of this disease continue a week or ten days, while a majority of them lasts two or three weeks. In some rare cases, two or three months, or even more, elapse before they terminate in recovery or death. I do not know that I can give you any authority for these statements, but, as the results of my observation, I think them to be correct.

The difference in the lesions found after death in these diseases is quite as striking as the difference in symptoms. I have before told you that one of the most constant lesions found in septicæmia is the hyperæmic, swollen, and softened condition of the mucous membrane of the intestinal canal; but I regret to say that, in the report of the autopsy of the first case, there is a neglect to mention the condition of the intestinal mucous membrane. In the latter case, there were several small abscesses in the right lung, points of apoplectic extravasation in the left, pus in the right shoulder-joint, thrombosis of left saphenous vein, all being characteristic lesions of pyæmia, but not of septicæmia.

Now, what is pyæmia? We understand by this term, a disease due to absorption of pus or its constituents in the blood. I have before incidentally alluded to some of the past theories which have been entertained as regards the origin of this infection. That it generally resulted from antecedent suppurative phlebitis, was the accepted doctrine of many from the time

of Dance until the discoveries of modern pathologists demonstrated its fallacy, by proving that inflammation of the lining membrane of the vein is very rare, and that thrombosis is not the result, but is more frequently the cause of phlebitis. Then there was the doctrine of purulent absorption; and there was a great deal of discussion as to whether it was possible for pus-corpuscles to pass into the blood through the coats of vessels without solution of continuity, and be deposited in different organs. Now, although it appears to have been demonstrated by very recent microscopical researches, that, under certain conditions of disease, pus-corpuscles do pass through the coats of vessels and migrate from abscesses into other tissues, yet it seems very certain that pyæmia is not simply a diseased condition due to excess of pus-corpuscles. The phenomena of this affection are eminently of a toxæmic character, and there is no reason for believing that this quality belongs to the pus-corpuscle *per se*.

The discovery of Virchow, that capillary embolism results in small points of hemorrhagic extravasation, or infarctions (*infarctus*), as they are termed, which cause mechanical obstruction and excite suppurative inflammation, just as any other foreign body would, seems to explain the metastatic abscesses of pyæmia. But the embolism-theory does not explain the constitutional symptoms of this affection, which are altogether disproportionate to these local causes. These visceral infarctions have been found without the constitutional symptoms of pyæmia; and, on the other hand, there are well-marked cases of pyæmia without infarctions. The effects of embolism are chiefly mechanical; while pyæmia is manifested by symptoms of severe toxæmia. Capillary embolism no doubt often consti-

tutes an important element in pyæmia, but the symptoms of this disease cannot be explained by mechanical obstruction or by the disintegration or degeneration of thrombi.

In a recent discussion of this subject before the Academy of Medicine of Paris, Professor Verneuil, in a brilliant rhetorical effort, advocated the theory that pyæmia is in fact only a severe septicæmia, with complications, or, as he would term it, septicæmic embolism. But I do not see how septicæmic embolism can explain the purulent deposits in the joints, or the subcutaneous abscesses of pyæmia.

So, then, even at the present day, our positive knowledge of the pathogeny of this affection is little more than this: that, in certain conditions of the system, induced either by traumatism or by disease, the absorption of pus, or of some of its elements, into the circulation, develops a class of phenomena now well recognized and understood. The disease, then, is really a purulent infection of the blood. It is known to be this, because the same phenomena follow when pus, or even the serum of pus, is injected into the veins of animals, and because the disease occurs under those conditions following suppuration which permit the entrance of pus into the circulation. Thus it occurs after amputations and other surgical wounds attended with the secretion of pus; it is particularly liable to follow injuries of the bones; and it sometimes has resulted in consequence of operations for hemorrhoids, or has caused a fatal termination in cases of abscess in the ear. But it also occurs when there has been no antecedent traumatism. Dr. Murchison, of London, states that he has several times examined patients who had died of pyæmia following typhus, in which there were no ulcerated sur-

faces, no bed-sores, no open wounds whatever, and yet pus was found deposited in the joints, under the skin, and in the internal organs. Professor Bennett, of Edinburgh, Sir Thomas Watson, and, indeed, many others, have reported cases where pyæmia has occurred in the course of other diseases, such as fevers and rheumatisms, in which the disease has not been preceded by open wounds or external suppuration. It seems evident, then, that certain morbid conditions of the blood, which exist in these diseases, predispose to the formation of pus, and its absorption in the circulation.

In the puerperal state, a certain amount of traumatism always exists at the placental seat of the uterine cavity, and generally at the os tincæ or at the vulva; but this is a natural, constant, and harmless condition, and not a formidable, permanent danger. The traumatism only becomes dangerous, when there exists some antecedent morbid condition of the blood, either from epidemic influence or from some special toxæmia. Hence, I think that the significance and importance of traumatism, in developing puerperal pyæmia, are greatly exaggerated by many recent writers on this subject. The disease is not a frequent one, even in hospital practice. In several epidemics of puerperal fever, which have occurred in my service in this hospital, pyæmia rarely, if ever, was met with as a complication, but, in two of these epidemics, it was rather frequent.

Now the question comes up, whether the symptoms and signs of this affection be so clear and well-determined, as to enable us to make the diagnosis of its existence. In my previous remarks, I have incidentally referred to many of the symptoms, but let us now study them more carefully.

The chills, which recur repeatedly, but without fixed

periodicity, are never absent in pyæmia. The severity of the chill is, to a certain degree, a measure of the intensity of the pus-poisoning, but, in estimating this, we must make due allowance for individual differences, in the nervous irritability of the subjects of attack. Each recurrence of chills is an indication of a new invasion of pus in the blood, and, very probably, a new point of tissue-inflammation. In connection with the chills, we have to note also a rapid rise in temperature, which reaches its height at the end of the chill. The skin and the limbs feel cold because the blood has been driven away from the capillary surface by the spasm of the subcutaneous muscles which the chill produces, but the thermometer demonstrates that the actual temperature has risen several degrees, generally as high as 104°, sometimes to 105°, 106°, or 107°. After the chill, the temperature begins to fall. As in fever and ague, the chill is generally followed by a period of dry heat, and then a period of sweating, during which the thermometer falls to the lowest point which occurs during the disease. But there is no complete intermission, no periodicity of recurrence. Sometimes the chills do not return for two or three days, and then again they may recur two or three times a day. The complexion in pyæmia becomes of a leaden, yellow hue, and often decidedly jaundiced, while in septicæmia there is generally a dark scarlet redness of the cheeks. It is wonderful to see what a quantity of pus the system will form and discharge in pyæmia. Rapid emaciation is therefore a symptom which we should naturally expect in this disease.

Beside these general symptoms, there are also those which arise from the local developments of the disease, such as abscesses in the cellular tissues of the extrem-

ities or in the decumbent portions of the trunk, purulent effusions in the articulations, or suppurative inflammation of the breast or of the eye.

The symptoms which characterize purulent deposits near the external surface and in the joints are readily recognized, but they are often very obscure when the deposit takes place in internal serous cavities, such as the pleura and pericardium, as are also the symptoms of metastatic inflammation in the lungs, the liver, or the kidneys. The pulmonary complication is the most frequent. The small abscesses in the lungs may be so scattered as not to give rise to cough or dyspnœa; but, if there be bloody sputa with catarrh, we may feel well assured of their existence. If the pulmonary affection be of any considerable extent, it will probably manifest itself by hurried respiration, cough, and perhaps pains in the chest, and, on auscultation, there will be heard bronchial *râles* with broncho-vesicular respiration. Of course, percussion will settle the question whether there be pleuritic effusion or not.

Purulent accumulation in the pericardium is sometimes very large. Some years ago, I was present at an autopsy made by my colleague, Professor James R. Wood, in a patient of Dr. Livingston, who died of pyæmia after miscarriage, and we estimated the amount of pus in the pericardium to be not less than twelve ounces. Generally, purulent effusion in the pericardium is complicated with either pericarditis, or endocarditis, or both.

Jaundice is not conclusive evidence that there are hepatic abscesses; as, even when most intense, in some cases, there has only been found acute diffuse softening of the liver. But, if there be great pain in the region of the liver, we have strong grounds for suspecting the existence of abscesses.

If, in the course of pyæmia, the urinary secretion greatly decrease in amount, and the urine become bloody and albuminous, and contain epithelial casts, we are safe in making the diagnosis of acute metastatic nephritis.

I must add a few words in regard to the prognosis in puerperal pyæmia. You will find that most writers speak of it as a very fatal disease, and some go so far as to say that a great majority of cases die. I am very much inclined to the belief that it has got this character chiefly from its frequent fatal termination in surgical cases, and that, as a puerperal disease, it does not deserve so bad a reputation. In surgery, the danger is greatly increased by its association with severe wounds and injuries, which demand the full vigor of the vital powers for repair. Both as a surgical and a puerperal disease, the danger is in proportion to the intensity and frequency of the infection, and, in the former, the source of the infection is generally more constant and permanent. We determine the intensity of the infection by the severity of the chills, and the degree of fever, measured by the thermometer. The more frequently the chills are repeated, the more rapidly the system becomes affected, and the earlier the symptoms of metastatic inflammation appear. If the chills be mild in degree and recur only after intermissions of one, two, or three days, and if the highest rise of the thermometer be not over 104°, then we may have a reasonable hope that the metastatic inflammations will be mild and limited in extent. It is obvious that purulent effusions in the articulations and abscesses in the subcutaneous cellular tissues are much less dangerous than metastatic inflammations of the visceral organs.

The prognosis in pyæmia turns very much on the

question as to what diseases precede or are associated with it. It greatly adds to the danger of the various pelvic phlegmasiæ. It is a very serious complication with phlegmasia dolens. When it occurs in puerperal fever, I think the prognosis is always grave, although I have seen quite a number of cases of recovery even under these circumstances. For example, I may briefly refer to one case, because it occurred in my service in this hospital, was reported by Dr. Cobb, then house-physician, and was published seventeen years ago. In January, February, and March, 1857, we had a severe epidemic of puerperal fever here, and, in two out of every three cases of death, the autopsies revealed extensive suppurations or abscesses in the lungs. The patient referred to, Matilda Smith, was delivered of her first child in our lying-in wards, February 11th. Six days after, that is, February 17th, she was attacked with puerperal fever, which commenced with a severe chill. For ten days she had a very weak and irritable pulse, generally ranging from 135 to 140, with profuse and offensive vaginal discharges; she vomited frequently a greenish colored fluid, and she became somewhat deaf. February 28th, that is, the seventeenth day after delivery, symptoms of pyæmia appeared. She had recurrent chills, followed by profuse perspirations, and then a severe attack of capillary bronchitis, undoubtedly due to pulmonary metastatic inflammation, which was treated by extensive dry cupping and the carbonate of ammonia. About the same time, there came a large bed-sore and an abscess in the right mamma, which gave exit to at least two pints of offensive pus. There had been no secretion of milk for more than two weeks. On the 4th of March, it is recorded that she took a moderate quantity of beef-tea, two bottles of porter, and thirty ounces of

port-wine. At this time, her pulse ranged from 125 to 135, and she had very profuse perspirations. Her convalescence was slow, on account of the extensive suppurations; but early in April she was discharged cured. Since this case was published, I have seen several other cases of recovery from pyæmia developed during the course of a puerperal fever.

The complication of pyæmia with septicæmia, or septicæmic pyæmia, I regard as a very fatal disease. I must also mention one complication, in which I have never seen a case of recovery, that is, pericarditis or endocarditis with puerperal pyæmia. In my service in this hospital, I have had four deaths from this cause, since 1860. The publication of the very remarkable essay on puerperal arterial obstruction, by Professor Simpson, in 1854, and that on puerperal endocarditis by Virchow, in 1858, are the two papers which first called the attention of the profession to the puerperal cardiac lesions. Many cases have since been reported by different observers, and these lesions are found to be not very rare.

The treatment of pyæmia must be governed, to a great extent, by the therapeutic indications of its associated diseases. In discussing mammary abscesses, phlegmasia dolens, metritis, phlebitis, pelvic peritonitis and pelvic cellulitis, I have already given my views, to a certain extent, on the treatment required in connection with pyæmic complications, and I shall again refer to it, in my lectures on puerperal fever. I shall now, therefore, only make a few suggestions, first, in regard to the constitutional treatment of pyæmia; and, second, as to the special treatment of the local lesions of this affection.

I regard quinine and alcohol as the two great reme-

dial agents in the constitutional treatment of pyæmia. In expressing my conviction that quinine is nearly as valuable and efficient in the treatment of pyæmia as in the treatment of intermittent fever, many, no doubt, will regard the remark as extravagant. I am well aware that my constant insistence on the anti-pyogenic effect of quinine, in my clinical lectures for the last fifteen years, may excite the suspicion of undue enthusiasm, and diminish the weight of my opinion, but it is a firm faith with me, based on constantly-accumulating experience. The quinine should be given in full, effective doses, as from ten to fifteen grains in the morning, and from fifteen to twenty at night. I have even given it in larger doses than these. When, from idiosyncrasy, there is intolerance of this agent, I give from ten to fifteen grains of the bromide of potassium with each dose of the quinine, which seems effectually to counteract the unpleasant cerebral symptoms, which it sometimes causes. It has been objected to large doses of quinine, that there is danger of producing paralysis of the motor power of the heart. But I have never observed any tendency to such a result, perhaps because of the large use which I make of stimulants at the same time. These should be given as freely as the patient can be induced to take them. The tolerance of alcoholic stimulants in pyæmic patients is very remarkable. It seems quite impossible to intoxicate them. One delicate lady, who had never been accustomed to the use of wine, but who had pyæmic pneumonia, abscesses in both breasts, and an abscess in the calf of the left leg, which discharged an enormous quantity of pus, took, in four days, five bottles of brandy, and two and a half drachms of quinine. I know that the patient, instead of the nurse, got the brandy, because it was all given very reluctantly

by a teetotal mother. I may here remark, parenthetically, that this lady, since her recovery, has had a great aversion to every kind of stimulant, and, I will add, that I have never known a single instance where a patient has acquired a dangerous taste for stimulants by their use in the treatment of an *acute* disease. Generally, it is difficult to get patients to take a sufficient quantity. They soon become disgusted, and, with my private patients, I find it necessary to frequently change the article from brandy to whiskey, rum, sherry, madeira, or champagne.

Pyæmia is not a disease usually attended with much pain, but patients are restless and uneasy, and I therefore advise an opiate at night to secure good sleep. Food, the most nourishing and the most easily digested, should be urged upon the patient, and skill should be used to make it tempting and palatable. The importance of keeping the room well ventilated, and of refreshing the patient by frequent and local ablutions, is sufficiently obvious without farther remark.

The treatment of the local lesions of pyæmia is a very important consideration. Little can be done for the effusion in the articulations, except to apply anodyne fomentations. These effusions sometimes disappear as quickly as they come, but, when this happens, you may always expect a speedy development of the disease in some other quarter. Hence, in these cases, it is very important to make frequent physical examinations of the thorax by auscultation and percussion, for the pulmonary and cardiac lesions are very latent, and, in the onset, are frequently manifested by but few of the general symptoms of these lesions. If bronchial *râles* or broncho-vesicular respiration be heard, I should recommend dry cupping between the shoulders, and

subsequently I have found blisters over the chest to be of great service. If symptoms of capillary bronchitis appear, the carbonate of ammonia seems to be the best remedy that we have.

When there is extensive effusion into the cavity of the pleura, I should not hesitate to recommend the withdrawal of the fluid, either by Wyman's instrument, recommended by Bowditch, or by the aspirator of Dieulafoy. In two cases of puerperal pyæmia, I have performed thoracentesis, one of which recovered, and I saw her, eight years afterward, in very good health.

In puerperal pyæmia, I am disposed to think the metastatic inflammation of the liver is rare. In 1857, I had three cases in this hospital, which were ushered in by recurring chills, nausea, bilious vomiting, and pain over the liver, with a very deep icterode hue of the skin and conjunctiva. Two five-grain doses of turpeth mineral were given at intervals of fifteen minutes, which acted very promptly and easily as an emetic, without being followed by prostration. On the contrary, each of the patients declared that she felt less weak after the action of the emetic was over. Dry cups were afterward applied over the liver, and, with the subsequent general treatment of pyæmia, all of these cases recovered. I have seen no cases like these since that time.

The nephritic lesions have been, in my experience, much more frequent than the hepatic. I believe the reverse is said to be true in surgical pyæmia. If the urine become scanty, bloody, and albuminous, I order dry cups over the kidneys, the free use of diluent drinks, such as the mineral waters, and the tincture of the chloride of iron. This also is very useful, in conjunction with the chlorate of potash, when there are very profuse discharges of pus from external abscesses. It

is very desirable that medicines should be made as little disagreeable as possible, and I shall therefore give you a formula, which I frequently use in the administration of the tincture of the chloride of iron:

℞. Tinc. ferri chloridi,	℥ ss.
Aq. puræ,	℥ iijss.
Potass. chlorat.,	℥ ss.
Syr. aurant. cort.,	
Glycerin. puri, āā	℥ ij.

M. S. A tablespoonful, in a wineglass of sugar and water, four times a day.

At the period when the chloride of iron is required, the time has gone by for the prophylactic and curative effect of the large doses of quinine, but I frequently find it useful to add, to each dose of the above mixture, from three to five grains of the hydrochlorate of quinine.

In conclusion, gentlemen, I shall only add, when you have a case of puerperal pyæmia, do not pronounce the verdict of death, even in your own minds, but determine to combat it with all the wisely-selected therapeutic resources which you can command, and I am sure that your chance of success will be greater than if you be influenced by skeptical doubts as to the value of remedies.

LECTURE XIX.

PUERPERAL FEVER.

Cases—Analysis of the symptoms in these cases—Prevalence of a similar epidemic in the city—Proportionally as severe in the wealthy classes as among the poor—Frequently occurs also in rural districts—It is therefore not a disease peculiar to hospitals—Great diversity of opinion as to the nature of puerperal fever—Variety of theories—The theory of the localists—The theory of traumatism and septicæmia—D'Espine, Spiegelberg, and Schroeder—The theory that puerperal fever is an essential fever—The term puerperal fever used by some to include all diseases of the puerperal state, which are accompanied with fever—Opinions of Tyler Smith, Barnes, and Braxton Hicks—The theory of Professor Martin, of Berlin—The theory of Hervieux—Objections to the theory of the localists—Objections to the theory of traumatism and septicæmia—Objections to the theory of Hervieux—Objections to the theory of Professor Martin—Objections to the use of the term puerperal fever as including all the febrile diseases which occur in the puerperal state—A few general laws of medical nomenclature—General propositions in regard to puerperal fever.

Gentlemen: During my present term of service, which began January 1, 1873, four women have died from a peculiar form of puerperal disease. In nearly all who have been delivered in the hospital, during this service, there have been more or less symptoms of constitutional disturbance, with a quick pulse and a high temperature. Some were very ill for a few days only, after which the convalescence was rapid. Others were very sick for two or three weeks, and did not perfectly recover until after five, six, or seven weeks. I have very full reports made by the house-physicians who had the charge of these cases, but it would take up altogether

too much time to have these read in detail, and I shall therefore give you only an abstract of the report of each fatal case, and of some that recovered.

"CASE XXXII.[1]—Annie S——, aged twenty-five, single. Born in Germany, a lady by birth and education. She has been in this country four and a half months. She has not allowed her family to know where she is. She has been extremely nervous and depressed. She was delivered December 31, 1872, of a boy weighing nine pounds, eight ounces. Vertex, R. O. P. Labor twenty-seven and a half hours.

Evening.—A few hours after labor. Respiration 28, pulse 104, temperature 99°.

"*January 1st*, A. M.—Respiration 20, pulse 120, temperature 102°. P. M.—Respiration 50, pulse 145, temperature 105°.

"*January 3d*, A. M.—Respiration 40, pulse 105, temperature 103.° Sweating profusely.

"*January 4th*, A. M.—Respiration 30, pulse 138, temperature 102°. Patient has had a chill, but has complained of no pain, and there is no abdominal tenderness. She is excited and nervous, and often wanders.

"*January 5th*, A. M.—Respiration 40, pulse 120, temperature 102°.

"*January 6th*, A. M.—Respiration 36, pulse 138, temperature 101°

"*January 7th*, A. M.—Respiration 30, pulse 110, temperature 102°. Abdomen somewhat tympanitic, with slight pain on the right side.

"*January 8th*, 11 A. M.—Respiration 60, pulse 135, temperature 104°. 3.30 P. M.—Respiration 36, pulse 120, temperature 100°. 8 P. M.—Respiration 36, pulse 120, temperature 102.7°. Patient says she feels quite well. She has taken quinine, morphia, and had turpentine-stupes to the abdomen.

"*January 9th.*—During the day, the respiration was from 24 to 30, pulse 120, and temperature 103°, with but slight variation. The bowels, which before have been regular, did not move to-day. She has never complained of nausea or vomited. Perspires profusely. Has no pain. Some subsultus. She is taking quinine and

[1] Condensed from a report by George A. Van Wagenen, M. D., house-physician to Bellevue Hospital.

the tincture of the chloride of iron, with occasionally small doses of morphia. Tincture of veratrum viride, gtts. iij, every second hour.

"*January 10th*, A. M.—Respiration 18, pulse 90, temperature 100.7°. 12 M.—Respiration 30, pulse 105, temperature 102°. 10 P. M.—Respiration 25, pulse 108, temperature 103°. During the afternoon, there was slight pain over the abdomen, and, for the first time, she complained of tenderness on percussion. She vomited in the morning a dark-green liquid, after which she said that she was very much better. Medicine continued.

"*January 11th*, A. M.—Respiration 16, pulse 90, temperature 102.7°. Very much under the influence of the morphia and veratrum viride. Some abdominal tenderness. Respiration shallow and irregular. 12 M.—Respiration 30, pulse 105, temperature 103.6°. Cheeks much flushed. Taking brandy and milk. 9 P. M.—Respiration 18, pulse 110, temperature 102.5°. Has taken during the day a pint of ale and as much beef-tea.

"*January 12th*, 3.45 A. M.—Respiration 18, pulse 90, temperature 103°. Has no abdominal pain. Pulse stronger. Vomited for the first time in twenty-four hours, after taking some porter. Sleeps most of the time, but when awake answers intelligently. 12 M.—Respiration 18, pulse 114, temperature 103.7°. She has had a natural fecal stool. No abdominal tenderness. Tongue dry and covered to the tip with a brown coat. 6 P. M.—Respiration 20, pulse 120, temperature 103.6°. Face flushed and burning-hot. Mild delirium, which later became more active. She has vomited several times. Hands cold, but feet warm.

"*January 13th*, 4 A. M.—Respiration 30, pulse 120, temperature 103°. 9 A. M.—Respiration 28, pulse 150, temperature 105°. 4 P. M.—Respiration 26, pulse imperceptible at the wrist, temperature 107°. Died, 4.15 P. M.

"*Autopsy, by Dr. Francis Delafield, twenty-two hours after death.*—Brain not examined. Pleura normal. Lungs, only the lower lobes congested. Slight serous effusion in pericardium, and slight atheroma of aortic valves. Kidneys normal. Entire peritonæum and viscera coated with thick, yellow lymph. The peritonæum not congested. About two pints of purulent serum in the peritoneal cavity. No change in the connective tissue of the pelvic cavity. The peritoneal covering of the uterus, coated with lymph. The uterine sinuses, at the insertion of the broad ligaments, filled with puriform fluid and broken-down thrombi. Small abscesses in the

uterine tissue. Fallopian tubes deeply congested. Ovaries and broad ligaments normal.

"CASE XXXIII.[1]—Annie S——, born in England, single, age seventeen, was delivered of her first child, a girl weighing six pounds, fourteen ounces, January 1, 1873, after a short and normal labor. Her parents reside in Michigan, and she was sent away from home after she was found to be pregnant, which made her very unhappy, and she was very much depressed after her labor. On the next day, the respiration was 36, pulse 140, temperature 103°. She had a chill, but no pain. Vaginal injections with carbolic acid. Quinine, grs. xxx, during the day.

"*January 3d* (third day).—Respiration 36, pulse 140, temperature 103°. Slight abdominal pain. Vagina washed out with carbolic acid. Quinine, morphia, and veratrum viride.

"*January 4th.*—Respiration 16, pulse 120, temperature 102°. Has slept well. Very little pain. Moderate tympanites. Turpentine-stupes to the abdomen. Other treatment continued.

"*January 5th.*—Respiration 16, pulse 120, temperature 102°. Countenance anxious. Occasionally starts with pain.

"*January 6th.*—Respiration 36–40, pulse 140–160, temperature 99°–106°. She vomited this morning about a half-pint of yellow fluid, and with it a lumbricoid worm about twelve inches in length, after which there were less pain and tympanites, and the patient said that she felt much better. The veratrum viride was stopped. The other treatment was continued, with brandy as freely as she would take it.

"*January 7th.*—Respiration 26–30, pulse 140–160, temperature 103–104°. Delirious, but answers questions intelligently. During the day, she vomited frequently in small quantities. The tongue became dry and brown. Hiccough and subsultus. The abdomen became very much distended. Appetite good. She asks for food. But a few hours before death, she drank a glass of milk and ate a piece of bread. Died at 4.35 A. M., January 8th."

"*Autopsy, by Professors J. W. S. Arnold and E. G. Janeway.*—Heart, lungs, and spleen, normal. Liver, fatty and congested. Interstitial nephritis. General and metro-peritonitis. Abdominal cavity filled with purulent fluid, which contained but little lymph in proportion to the amount of pus. There was endometritis, and the

[1] Condensed from a report by George A. Van Wagenen, M. D., house-physician to Bellevue Hospital.

uterine walls were infiltrated. The uterine sinuses also contained a sero-purulent, semi-solid material. Cellular tissue of broad ligaments infiltrated with a serous material containing pus."

"CASE XXXIV.[1]—Ellen H——, aged eighteen, born in Ireland, was delivered of a girl weighing seven pounds, twelve ounces, January 11, 1873. Labor normal. First stage, four and a half hours; second stage, two hours and twenty minutes; third stage, ten minutes.

"*January 12th* (first day).—Respiration 18, pulse 70, temperature 98°.

"*January 13th* (second day), A. M.—Respiration 18, pulse 80, temperature 99°. P. M.—Respiration 35, pulse 105, temperature 102°. In the evening, she was in a terrible state of excitement. With a face flushed, and with violent sobbing, she accused other patients of telling stories about her. Morphine.

"*January 14th.*—Respiration 36, pulse 120, temperature 104°. She had a chill in the night. The patient has not a single symptom to correspond with this record. She is quiet and rational, and has no pain anywhere. Lactation established yesterday. Lochia normal.

"*January 15th.*—Respiration 24, pulse 100, temperature 104.6°. Nervous and wild. Quinine and morphine. Vaginal injections with carbolic acid.

"*January 16th*, A. M.—Respiration 25, pulse 135, temperature 103°. Very nervous. P. M.—Respiration 30, pulse 136, temperature 103°. Quiet. 10 P. M.—She suddenly became very wild. Talked very boisterously, and was very obscene. Face flushed. She is ordered chloral hydrat. ℈j, potass. bromid. grs. xxv, every second hour until she sleeps.

"*January 17th*, A. M.—Respiration 24, pulse 120, temperature 102°. Very quiet. P. M.—Respiration 24, pulse 108, temperature 102°. Chloral and the bromide have been given twice to-day. Has had no excitement.

"*January 18th*, A. M.—Respiration 22, pulse 104, temperature 102°. Face and palms of hands covered with an eruption resembling erythema nodosum. Complains of pain in the bones. P. M.—Respiration 24, pulse 108, temperature 100°. Face still flushed, but the

[1] Condensed from a report by George A. Van Wagenen, M. D., house-physician, and M. H. Forrest, M. D., senior assistant physician, to Bellevue Hospital.

eruptive congestion has subsided. Rational, and says that she is very comfortable.

"*January* 19*th*, A. M.—Respiration 30, pulse 108, temperature 101.6°. Has slept well. P. M.—Respiration 28, pulse 126, temperature 103°. Rational, and feels well.

"*January* 20*th*, A. M.—Respiration 26, pulse 118, temperature 103°. Slept well last night. P. M.—Respiration 20, pulse 114, temperature 103°. The bowels, which before have been regular, were quite loose to-day. Perfectly rational.

"*January* 21*st*, A. M.—Respiration 18, pulse 104, temperature 102°. P. M.—Respiration 18, pulse 108, temperature 103°. She has been taking, since the 18th, quinine, morphine, brandy, and milk, but she has not required either chloral or the bromide. 7.30 P. M.—Respiration 18, pulse 120, temperature 105°. Has a little pain and tenderness in the abdomen for the first time, and slight tympanites. 11.30 P. M.—Respiration 30, pulse 150, temperature 105°. Tympanites and tenderness increased, but not severe.

"*January* 22*d*, A. M.—Respiration 18, pulse 120, temperature 102°. 5 P. M.—Respiration 24, pulse 120, temperature 103°. She became delirious again to-day, and screams when spoken to. 11 P. M.—Respiration 20, pulse 124, temperature 105°.

"*January* 23*d* (eleventh day), A. M.—Respiration 22, pulse 136, temperature 108°. She gradually sank, and died at 11 A. M.

"*Autopsy by Dr. J. W. S. Arnold.*—Heart, lungs, liver, and kidneys, normal. Spleen, dark-olive color. Abdomen, no injection of the peritonæum, and no fluid in the peritoneal cavity. No exudation, except on the external surface of the uterus, and a portion of intestine adhering to it. Internal surface of the uterus normal for the period, except that the sinuses at the cornua were filled with a puriform fluid. The pelvic connective tissue appeared normal.

"Case XXXV.[1]—Miss S——, born in Germany, aged twenty-four, was delivered by forceps, after a labor of twenty-seven hours, February 2, 1873. The perinæum was slightly torn, and two sutures were applied.

"*February* 3*d*, A. M.—Pulse 80, temperature 100°. No pain. Milk appearing.

"*February* 4*th*, A. M.—Respiration 24, pulse 106, temperature 104.7°. She had a chill, and then pain in the abdomen all night.

[1] Condensed from a report by M. B. Early, M. D., house-physician to Bellevue Hospital.

Thirst. Ordered solution of morphia (U. S. P.), ʒ ij, and tinc. aconit. (Flemings's) ♏.ij, every hour. Also three laxative pills. P. M.—Respiration 28, pulse 108, temperature 103.5°. Pain less, and but slight tenderness over abdomen. The pills having had no effect, an injection was ordered. Morphia and aconite, in the same doses, every second hour.

"*February 5th.*—Respiration 18, pulse 100, temperature 100°. Some pain and tenderness in the right iliac fossa.

"*February 6th.*—Respiration 22, pulse 108, temperature 101.7°. Some abdominal pain.

"*February 7th.*—Respiration 32, pulse 120, temperature 102.5°. Vomiting and diarrhœa. Very nervous. Complains of pain in the abdomen. Tinc. aconit. ♏. ij, sol. morph. (U. S. P.) ʒ iij, every hour.

"*February 8th.*—Pulse very rapid, temperature 102°. Skin hot and dry. Both cheeks red, swollen, and painful. Tongue dry. No diarrhœa to-day. Quinine, grs. x, *ter in die.* Brandy and extra diet. P. M.—Respiration 38, pulse 128, temperature 102.5°. Solution of morphia, ℥ ss, on account of severity of pain.

"*February 9th*, 3 A. M.—Sol. morph. (U. S. P.), ℥ ss. 9.30 A. M.—Respiration 30, pulse 128, temperature 102.7°. Abdominal pain, tenderness, and tympanites, slight. Patient feels better. Treatment continued. 7.30 P. M.—Respiration 28, pulse 140, temperature 101.5°. Skin warm and moist.

"*February 10th*, 9.30 A. M.—Severe pain in the abdomen, which was very tympanitic. Respiration 60, pulse 140, temperature 105.5°. 11 P. M.—Respiration 48, temperature 105°. Pulse could not be counted. Died, February 11th, 1.45 A. M.

"*Autopsy, by Dr. Francis Delafield.*—Brain, not examined. Heart and lungs, normal. Both pleura covered with pus and fibrine. Liver, rather large and soft. Spleen, large and soft. Kidneys, normal. Peritonæum, venous congestion, coated with fibrine and pus, and a small amount of purulent serum in the cavity. Uterus well contracted. Internal surface and walls normal. In the right side, some of the sinuses at the insertion of the lateral ligament were full of puriform fluid. Pelvic subperitoneal tissue normal. Bladder, normal."

In the cases which recovered, the histories of which I have not given, the symptoms were of the same character as those which occurred in the fatal cases. Some

were, for a time, apparently more severely ill than those who died. You will observe that all who died were single women, a fact on which I shall make some comment hereafter. In most cases, convalescence commenced within a week from the time of attack; but two cases were very tedious and protracted. Elizabeth E—— was delivered January 8th. On the 9th, her record was as follows: Respiration 24, pulse 75, temperature 100°. January 10th, respiration 18, pulse 102, temperature 101.5°. January 11th, respiration 24, pulse 84, temperature 100.5°. From this time the respiration was never less than 24. The pulse, except when reduced by aconite or the veratrum viride, ranged from 112 to 140, and the temperature, from 104° to 105°. From February 8th to February 17th, the respiration and temperature were nearly normal, but the pulse kept above 100. On the 17th, she had recurring chills, and there came on pain and swelling in the left inguinal region. This was painted with the tincture of iodine, and she was given quinine in full doses. On the 25th of February, the inguinal pain and swelling had disappeared. The respiration was 20, pulse 92, and temperature 99°, and she was thoroughly convalescent. Thus her illness continued forty-five days. The case of Mrs. J. W—— was still more remarkable. While on her way to this city, she was delivered in the cars on the Erie Railroad, January 14th, and she was brought to the hospital January 15th. On the 16th, her respiration was 24, pulse 90, temperature 99.5°. In the afternoon, she had a severe chill, which lasted a long time. January 17th, A. M., respiration 34, pulse 158, temperature 104.5°. Her skin was hot and dry, face flushed and dusky, and she had some abdominal pain and tympanites. The tongue was slightly coated, but moist.

Lactation had been established, but the breasts were not painful. Her condition until February 7th was very critical, and after this time her recovery was slow, as she was not able to be up and about the wards until March 8th.

I attribute the recovery of many patients, in a great measure, to the intelligent, faithful, and constant care of the house staff, who had the immediate charge of the cases. And here I may take the opportunity to say that, during the many years of my obstetric service in this hospital, I have constantly had occasion to express my warm appreciation of the untiring zeal and self-sacrificing devotion of my staff to the care of the puerperal patients. In severe cases, the symptoms have been recorded every hour, day and night, and I have many written reports of such cases. Some members of the staff have been severely ill after finishing their obstetric service, and generally it is found necessary to give them a little vacation to recruit their strength.

Now, if we study this group of puerperal cases, we shall find that certain prominent symptoms characterized all of them, and, clinically speaking, the disease was the same in all. From the second to the fifth day after labor, the pulse became quick, from 120 to 140; the respiration hurried, from 24 to 36; and the temperature high, from 101° to 105°. The attack was ushered in by a chill, and fever was a constant phenomenon. Neither abdominal nor uterine pain was an initial symptom. Generally, on the second day of the disease, a certain degree of abdominal pain and tenderness was present in most of the cases, but in no case were these symptoms so severe as to prevent the patient from lying on either side, or on the back with the legs extended; and in every case the pain was easily controlled by moderate

doses of morphine. The abdomen usually became somewhat tympanitic the day following the complaint of pain, but the tympanites was never excessive, except just before death. Vomiting occurred with several patients, but it was never a constant or a severe symptom. It often seemed to be due to veratrum viride, or, in some cases, to intolerance of certain kinds of stimulants. A moderate diarrhœa occurred in most patients, but in none was this so severe as to require treatment to prevent exhaustion. The mammary secretion was generally established, but diminished during the illness. In some, it returned abundantly after convalescence. The lochial discharges usually continued throughout the illness. Vaginal injections with carbolic acid were ordered to be used twice a day for every woman delivered in the hospital, and hence offensive or fetid lochia were very rarely observed. In the beginning of the attack, the tongue was usually moist, and covered with a white or brownish coat, but, after the second day, a dry, brownish streak down the centre and at the base of the tongue would be observed. In some of the cases, and in two that died, the appearance of the tongue was but little altered during the whole illness. The face was very much flushed in nearly all of the cases at the beginning of the attack, but this usually disappeared on the second or third day of the disease. Jaundice was not observed in a single case. The cerebral disturbances were not very marked, although in nearly all there was some wandering or mild delirium. In one fatal case there was violent mania. The skin was always hot and dry in the beginning, but profuse perspirations were common after the first two or three days.

While the clinical features of all these cases bear such a resemblance as to warrant us in asserting that

all were attacked by the same disease, you will observe that there is a very considerable diversity in the autopsical lesions. In the first and the second case, there was a very large effusion of purulent serum in the peritoneal cavity, and there was pus in the uterine sinuses. In the third case, the peritoneal and uterine lesions were very slight. In the fourth case, the lesions were chiefly of the pleura and peritonæum. The pelvic lesions were trivial. The connective tissue in the pelvic cavity was normal in all of the cases.

The same disease has been very prevalent in the city outside of the hospital, and has been proportionally more fatal among women of the upper classes, who lived under the best sanitary conditions attainable in the city, and who were able to command all the comforts and luxuries of life, than among the poor women who were crowded in tenement-houses, or those who were delivered in the lying-in wards of this and the Nursery Hospital.[1] During the first four months of the present year (1873), the mortality from puerperal diseases has been greater among women who may be described, with reference to their social condition, as belonging to the better classes of this city, than for the twenty preceding years.

Now, what is this disease? We call it puerperal fever; the name first given to this malady by Strother, who published a work on fevers, in 1716. More than two hundred epidemics of this disease have been described by different authors since 1740. It has been a terribly fatal disease in lying-in hospitals in all the great cities where such hospitals exist. It also occurs as an epidemic disease in private practice, not only in cities, but in rural districts. My first practical knowl-

[1] *See* Appendix.

edge of it began in 1843, in a country district of Connecticut, in which every woman who was delivered within a certain area, for some two months, died. The previous year it prevailed in the northern section of Vermont and New Hampshire. In the *American Journal of the Medical Sciences*, October, 1842, Drs. Hall and Dexter say that "its effects were observed in every situation and condition of life, in the populous town and lonely settlement, in the home of the rich and in the log-cabin of the poorest squatter." In the county of Caledonia, Vermont, there were thirty cases of "puerperal peritonitis," only one of which recovered. In Bath, New Hampshire, a little village of fifteen or sixteen hundred inhabitants, twenty mothers died from this disease. The late Dr. Samuel Jackson, of Philadelphia, formerly of Northumberland, and Dr. Dutcher, of Lawrence County, Pennsylvania, each described an epidemic of this disease which occurred in rural districts of Pennsylvania. Dr. H. G. Cary, of Dayton, Ohio, reported an epidemic of this malady which occurred in parts of the county of Montgomery, Ohio. This winter, I have noticed, in the *Philadelphia Medical and Surgical Reporter*, cases reported by Dr. W. O. Smith, as occurring in Newport, Kentucky.

I could give you many other illustrations which demonstrate that the opinion, held by some, is an error, that this is a disease peculiar to lying-in hospitals, or large cities, or that it is confined to the lower classes, and those who dwell in crowded, ill-ventilated, dirty apartments. I could also give you many facts showing that this disease is sometimes endemic; that is, that it occasionally prevails in a single locality, as in a hospital, or in a circumscribed district, and nowhere else, and therefore it is probably due to some local cause.

Furthermore, I think the evidence is overwhelming and conclusive that it is a contagious disease. I shall have more to say on this point hereafter.

But, if you consult your books to ascertain what the nature of puerperal fever is, you will find a greater diversity of opinion than exists in regard to any other disease. Very much more has been written on this than on any other one disease. I find that more than twenty thousand pages have been published on this subject within the last twenty years, and a complete bibliographical catalogue of all that has been written on puerperal fever would fill many pages of an octavo volume. The plethora of literature on this subject is a proof of the difficulties in its study, arising from the complications with which it is surrounded. It is a disease occurring in a peculiar state of the system, arising from a modified condition of the blood induced by gestation; from lesions of organs, resulting from compression, contusion, and laceration by the process of parturition; from a retrograde metamorphosis of uterine tissue; from the special physiological changes of the internal surface of the uterus; and from the development of the function of lactation.

Another reason why so much has been written on this subject, comes from the fact that authors have formed their opinions as to the nature of the disease from its study in one locality, or in one epidemic, and have adopted those restricted, exclusive ideas which result from the observation of one peculiar type. Many have written most dogmatically on the subject, who have made no comprehensive examination of all that has been learned as to the phenomena of the disease and its laws in varied localities, and in different epidemics. More than three-quarters of a century ago,

Dr. John Clarke wrote as follows: "Unfortunately, the uniformity of the disease was assumed, and each author erected his own experience into a standard, by which to judge of the descriptions and the practice of others."

I should not be warranted in taking up your time in giving you even a sketch of the various theories of the past, which now are dead and buried by the progress of science. But it is my duty, as a clinical teacher, to tell you what are the doctrines of the day; what are the teachings of writers of authority, who influence the profession at the present time. There are various distinct theories, each sustained by men of ability, and of the highest rank in the profession.

First, the theory of the *localists*, those who believe that there occurs primarily an inflammation of some one or more of the organs or tissues connected with the process of parturition, and that the fever and the general symptoms are secondary to and the consequence of these local inflammations.

At an early period, the theory of this school restricted the inflammation to one organ. You will find that many of the older writers believed the disease to be a metritis. Then came up another class, who regarded it as an inflammation of the omentum and intestines. There was another class, who believed the disease to be peritonitis, and another still, who believed it to be peritonitis connected with erysipelas, or peritonitis of an erysipelatous character. Then another set of observers, finding that in certain cases, and in certain epidemics, there was no peritonitis, believed the disease to be a phlebitis. Then, from this, followed the theory of lymphangeitis, and of purulent infection, and, finally, the more comprehensive school, which included in its theory of puerperal fever all the puerperal inflamma-

tions. But another class of observers, finding that the phenomena of these inflammations differed in many respects from those of ordinary inflammations, would explain this by the theory of a specific origin, but still claim that the disease is first developed as a local inflammation in some one of the organs or tissues connected with parturition. But I have only time to refer to such writers as influence the belief and the practice of the profession at the present day.

The late Professor Meigs, of Philadelphia, published a work on this disease, less than twenty years ago, the avowed object of which was "to prove that it is a simple state of inflammation in certain tissues of pregnant women and of women lately confined, and that the fever that attends it is a natural effect of intense constitutional irritation from the local disorders." Dr. Meigs considered puerperal fever as a metritis, a metrophlebitis, a peritonitis, or an ovaritis, or two or more of these plegmasiæ combined. In a discussion of this subject before the New York Academy of Medicine, in 1857, Professor Alonzo Clark declared that "the primary lesions of puerperal fever are in the organs of generation, the secondary are in the blood." He thinks that, in every case where a full examination is made, one of four lesions will be found; either peritonitis, phlebitis, lymphangeitis, or endometritis. He regarded those cases which had been described by authors as cases of puerperal fever without anatomical lesion, as probably being primarily an endometritis, resulting in pyæmia. "The patient died, not from the endometritis, but from the pyæmia."[1] In 1858, the year after the discussion had been opened here, this subject was taken up by the Academy of Medicine of Paris, and its dis-

[1] *New York Journal of Medicine*, 1857, vol. ii., third series, p. 370, *et seq.*

cussion was continued for nineteen sessions of the Academy, and thirteen of the most prominent obstetricians and the most eminent pathologists took part in it. The theory that the disease is a local inflammation was advocated by Beau, Piorry, and Jacquemier. Cazeaux regarded the disease as an inflammation, modified by a peculiar condition of the blood and epidemic influences. Trousseau considered the disease as a peculiar inflammation, due to a specific cause. Velpeau regarded it as a local inflammation modified by the puerperal state. The same year (1858), Professor Béhier published a most interesting and able essay on puerperal fever, in the form of letters addressed to Professor Trousseau, and his theory of the disease was that it is a purulent phlebitis. His opinion was based on the study of an epidemic, and the post-mortem examination of eighty-four women who died from this disease in the *Hôpital Beaujon*, and he avers that the uterine veins contained pus in every instance. The object of his essay was to prove that pus in the uterine veins is a constant anatomical lesion, and that this is always signalized by one constant local symptom which precedes all the general symptoms. This symptom, which is never absent, according to Béhier, is a cord-like hardness and a sensitiveness to pressure on the sides of the uterus where the appendages are attached. He distinctly asserts, in this essay, his belief that peritonitis in this disease is not primary but secondary to the phlebitis.

The theory that the disease is primarily a local inflammation has also been most ably sustained by M. Mattei and Professor Pajot, and by Dr. Berne, of Lyons, in an essay published in 1866. It, however, has found but few supporters among German writers, and I believe not a single obstetric writer of prominence in

Great Britain has advocated this doctrine within the last twenty-five years. Indeed, the only English writer of the present day who has defended the local theory of this disease, that I can recall, is Dr. Robert Lee, who can hardly be supposed to have much influence on professional opinion, as his unfortunate habit has always been to advocate, with bitter zeal, doctrines which the progress of science proves to be untrue.

Another school regards puerperal fever as analogous to traumatic fever, and the severer forms of it as being due either to septicæmia or to pyæmia. Many years ago, Cruveilhier pointed out the analogy between the surface of an amputated stump and the inner surface of the uterus, and he thought it not surprising that the secondary evils of amputation should be so similar to those of the puerperal state. In 1850, the late Sir James Simpson published a paper, in which he discussed the analogy between puerperal and surgical fever. He sought to prove that these diseases assimilated to each other: 1. In the anatomical conditions and constitutional peculiarities of those who are the subjects of them. 2. In the pathological nature of the attendant fever. 3. In the morbid lesions respectively left by either disease. 4. In the symptoms which accompany each affection. In this school we must include Raciborski, who regarded puerperal fever as a traumatic fever, which originated in the uterine veins and terminated as a suppurative uterine phlebitis. Hervez de Chegoin, Piorry, Bouillaud, and many others whom I might mention, were also advocates of the doctrine that the phenomena of this disease were due either to purulent or putrid infection, or to both. During the past year, Dr. H. A. D'Espine, of Paris, has published a very interesting and able contribution to the study of

puerperal septicæmia, which he regards as identical with puerperal fever. His conclusions may be thus briefly summarized:

He considers the disease as a series of accidents, more or less grave in proportion to the amount of septic material absorbed by traumatic surfaces in the utero-vaginal canal, and that the disease is not peculiar to the puerperal state, but assimilates to that which is produced in animals by experiments, and occurs surgically. He regards the disease as originating either in the uterus or in the vagina; that the lymphatics are the usual channel of absorption; that the peritonitis is a lesion of continuity due to the deposit of septic material by the uterine lymphatics, and he compares the peritonitis to the local inflammations which develop around infected wounds. The effect of absorption of septic material is to determine congestions in all of the organs, especially in the lungs, kidneys, and intestines, sub-serous ecchymoses or interstitial apoplexies, external or internal inflammations which localize by preference in serous membranes, and these effects are manifested during life by fever, diarrhœa, pulmonary congestion, epistaxis, and frequently by fugitive cutaneous eruptions. D'Espine believes that purulent absorption and septic absorption are confounded together as clinical affections. He furthermore asserts that there is no such thing as milk-fever, but what is called so is due to a slight septic infection from absorption of the lochia by small traumatic surfaces in the utero-vaginal canal. He considers puerperal pyæmia as a complication of septicæmia, which nearly always coincides with suppurative phlebitis.

In Germany, the theory that puerperal fever originates in traumatism, and is the result of absorption of

septic material, seems to be accepted by a large majority of the most recent obstetrical writers. Professor Spiegelberg, of Breslau, seems to belong to a modified school of localists, but is, at the same time, a supporter of the doctrine of traumatism and septicæmia. He says, that the entire class of puerperal diseases are inflammations which are seated either upon the inner surface of the genital canal, in its parenchyma, or in the adjacent tissues, or often in both the latter at the same time, and run their course either as local processes or lead to simple or embolic pyæmia. He asserts that the error of those who defend the theory of a primary blood-poisoning lies—1. In insufficient or inexact local observation; or, 2. In part, that the internal surface of the uterus has been so frequently regarded as the sole point of departure, and that, in consequence, the equally important affections of the vagina or vulva, and the more important affections of the connective tissue, have been overlooked. The state of the internal surface of the uterus and of the placental seat after delivery has been made the subject of special study by M. Robin, of Paris, Dr. W. O. Priestley, of London, Dr. Matthews Duncan, of Edinburgh, and Dr. Carl Friedländer.

Spiegelberg adopts the views of the latter, that the decidua is divided into two layers, the upper or cell-layer proceeding from the connective tissue of the mucous membrane, and a deeper, the glandular layer. During labor, the separation of the decidua takes place in the cell-layer, a thin portion of which, together with the glandular layer, remains adherent. At the place of placental attachment, precisely the same remains behind as remains over the entire uterine surface, and is only distinguished by the naked and thrombosed openings of the veins. The new epithelial cover is now gradually

formed, probably from the epithelium of the glands. Spiegelberg considers the internal surface of the uterus as a vast wounded surface, although in a different sense from what most authors have intended, when they have compared the placental site to an amputated stump. "For," he says, "a mucous membrane deprived of its epithelium and its superficial layer is just as much a wounded surface as a denuded corium." He adds, "The significance of this wound is heightened by the presence of the vein-lesion." To these wounds, found in every puerperal woman, he would add, "the slight contusions and abrasions of the cervix, without which hardly any labor takes place, the erosions and lacerations at the lower portion of the vagina, and the inner surface of the labia and vulva." These, he regards as rarely absent, and in this he agrees with Schroeder, who saw distinct rents of the mucous membrane of the vaginal orifice in eighty-nine out of ninety-three cases. Spiegelberg understands, by septicæmia, only the absorption of really putrid substances as they occasionally present themselves in diphtheritic inflammation of the genital mucous membrane exposed to the air, or where coagula or portions of the ovum have been retained.

One of the most recent of the German writers on this subject is Professor Schroeder, of Erlangen. He holds that "the theory that puerperal fever is due to infection with a specific material formed under atmospheric, cosmic, and telluric influences, acting exclusively upon puerperal women, is quite untenable," and he asserts that it is now almost universally abandoned. He defines puerperal fever as "all those diseases of puerperal women which are caused by the absorption of septic matter; that is, organic substances in pro-

cess of decomposition. That absorption may take place, a fresh wound is required by which the septic poison can enter." He says that, "through the intact skin or mucous membrane, through the lungs or intestinal canal, septic materials, as a rule, never as such enter the blood." And he then adds: "Fresh wounds exist in every puerperal woman. The sources from which the infecting matter is derived are twofold, one belonging to the infected organism itself, auto-infection; the other introduced from without, hetero-infection." After pointing out the various materials from which both auto-infection and hetero-infection may be derived, he adds, "Puerperal fever is nothing else but poisoning with septic material from the genital organs." He does not regard "puerperal fever as really contagious, for by a contagious disease is meant one in which a specific poison is produced within a diseased organism, and which, transferred to other individuals, always produces the same specific disease." He admits that "the disease is manually transferable, as the secretions of puerperal-fever patients, transferred to other women, may produce puerperal fever; but there is nothing specific in this, for it would be productive of the same results, if the secretions of decomposing organic compounds were transferred to any other wounds."

A third school regards puerperal fever as primarily a blood-disease, developed, like other zymotic diseases, by epidemic, endemic, and contagious causes; that in this disease a modification of the general organism occurs antecedent to the local lesions, and consequently the local lesions are secondary; that is, they are the result of the disease and not the cause—in short, that it is an essential fever.

This is the view of the disease which was main-

tained by the late Professor Joseph M. Smith and by myself, in the discussion before the New York Academy of Medicine, in 1857. It is the doctrine which was advocated by Guérard, Dubois, Depaul, and Danyau, in the discussion before the French Academy of Medicine, in 1858. A remarkably interesting and able essay, sustaining this view, was published by Dr. Paul Lorain, in 1855, and another of equal merit by Dr. Stephane Tarnier, in 1858.

This theory of the disease is also advocated by the eminent M. Monneret, who, in his course of lectures on "General Pathology," defines puerperal fever as an essential protopathic fever, prepared and developed by the puerperal state giving rise to morbid processes, of which the genital organs are the usual seat, and which consist of suppurative inflammations and other pathological changes, such as softening, gangrene, and hæmorrhage. According to Monneret, "the only incontestable fact is, that the fever is primitive, spontaneous, and results in the rapid production of inflammation in all the organs, and especially those of generation." He says that these inflammations develop in two or three days after the fever, in the same way as, in small-pox, there occur hundreds of little inflammations of the skin, first exudative, then suppurative.

In the transactions of the Obstetrical Society of London, for 1861, there is a most valuable paper by Dr. Tilbury Fox, based on a study of the disease, as it occurred at the General Lying-in Hospital of London, from 1833 to 1858, inclusive. During this time, there were four hundred cases and one hundred and eighty deaths, from puerperal fever. The conclusions of Dr. Fox lead me to class him as belonging to the school which regards this disease as an essential fever,

while he believes that the special fever-poison is identical with that of erysipelas.[1] Dr. Evory Kennedy, of Dublin, also belongs to this school, as you will readily see by reading his earnest and able work on "Hospitalism and Zymotic Diseases;" and I must include, also, another eminent obstetrician of Dublin, Dr. Alfred H. McClintock.

As I shall have occasion to discuss the doctrines of this school more fully hereafter, I shall pass to a fourth class, who include under the term puerperal fever all the zymotic diseases, such as typhus fever, scarlet fever, erysipelas, diphtheria, hospital gangrene, septicæmia, and all of the severe primary inflammations when they occur in a puerperal woman. This class does not reject the idea of a primary vitiation of the blood, but terms the disease a puerperal fever, whatever may be the specific nature of the primary poison. In this class is probably included a majority of the most eminent obstetricians of Great Britain, and among its supporters are such names as the late Dr. Tyler Smith, Drs. Robert Barnes, Braxton Hicks, Hall Davis, Graily Hewitt, W. S. Playfair, Wynn Williams, Leishman, of Glasgow, and many others.

In the discussion of the paper of Dr. Tilbury Fox, before the Obstetrical Society of London, Dr. Tyler Smith, in speaking of the importance of recognizing the infectious and contagious nature of puerperal fever, remarked that "the disease would not so often occur, if all accoucheurs recognized the fact that erysipelas, typhus, scarlatina, small-pox, hospital gangrene,

[1] I am informed by Dr. John C. Boyd, of Monroe, Orange County, N. Y., that, in 1850, malignant erysipelas occurred in a family in that village. Seven or eight women in the neighborhood were confined within a few weeks afterward, every one of whom died from puerperal fever, or, as he termed the disease, puerperal peritonitis.

putrid sore-throat, diphtheria, the post-mortem, and other poisons were excessively prone, if brought near the lying-in woman, to originate puerperal disease. He did not question but that any of the agents which produced zymotic maladies might cause puerperal fever, or that it might arise in individual cases from the retention and putrefaction of portions of placenta, or membrane, or coagula, or the decomposition of fibrinous clots in the uterine vessels, especially in women who were predisposed by hemorrhage, albuminuria, or other causes of debility; but contagion and infection, which might, to a great extent, be recognized and avoided, were its chief and most preventable sources."

In a course of lectures on puerperal fever, by Dr. Barnes, published in the *Lancet*, in 1865, the same doctrine as to the origin of the disease is advocated. He divides the causes which originate the disease, into two classes: "1. The heterogenetic or external causes, those agencies which, taking their rise in conditions foreign to the patient herself, have to be brought to her while she is in a state of susceptibility to their influence, in order that puerperal fever may be produced. 2. The autogenetic or internal causes, those which take their rise in conditions proper to the patient herself, there being no contamination from without. The poison, which ferments into fever, is generated within the patient." Dr. Barnes also gave expression to similar views, in the discussion of a paper read before the Obstetrical Society, in 1870, by Dr. Braxton Hicks. The paper of Dr. Hicks is based on a careful study of eighty-nine cases, which he classifies, not according to the symptoms, as is usually done, but according to the causes, so far as they could be ascertained. He divides these cases into two groups, the first having an ascer-

tained or probable cause, which he enumerates in the following classes: Class 1—Scarlet fever, A, with the usual rash, 20; B, without the rash, 17, of which 15 had been distinctly exposed to the fever, and the other 2 had very probably been exposed. Class 2—Erysipelas, 6. Class 3—Diphtheria, 7. Class 4—Typhus or typhoid fever, 2. Class 5—Decomposition of uterine contents, 9. Class 6—Emanations from sloughy womb, 1. Class 7—From puerperal fever, 1. Class 8—From mania (?), 4. Class 9—Pyæmia from sore nipples (?), 1. His second group comprises those cases in which the cause was uncertain. In this group there were 21 cases, in which the symptoms appeared before or during labor in 4, and between the third and fifth day in 17.

These opinions, as expressed by Drs. Tyler Smith, Barnes, and Braxton Hicks, are sufficient to give you a correct idea of the doctrines of my fourth class. In Germany, Scanzoni is the most distinguished of the obstetricians whose views in regard to puerperal fever would come in this class. In this country, there have been no recent publications on this disease which enable me to give you the views of our leading obstetricians, but, from my personal intercourse with the profession, I am inclined to believe that a majority, under the influence of the eminent English writers to whom I have referred, should be included in this last class. I know, however, some very able men who are strong supporters of the traumatic and septicæmic theories of the causes of this disease.

I must also give you two theories which demand notice, from the character and position of the persons who advocate them, but which do not express the opinion of a sufficient number of the profession to represent a class.

The first is the theory of Professor Edward Martin, of Berlin, that "the diphtheritic process in the genitals of lying-in women is the only essential element of puerperal fever." He does not include, in the term puerperal fever, the febrile affections which result from local inflammation, nor the fevers of contagious diseases, as scarlatina, variola, and typhus. His definition of the diphtheritic process is, that "it consists of a fungous formation, the spores of which are seen under the microscope to penetrate, not only into the tissues, but within the blood-vessels, producing in this way a generalized disease." He admits that, in diphtheria of the genital organs, investigations have as yet not extended thus far, but he assumes that "it is the same as when the disease exists in the pharynx." He claims that, "in a majority of cases of puerperal fever, we find, on the external genitals and the vagina, a diphtheritic deposit covering those wounded spots, which, in the form of larger or smaller lacerations of the mucous membrane, so frequently occur during labor. The circumference of these spots is more or less considerably swollen. In many cases, the diphtheritic deposit is thus confined to the external genitals, and the disease pursues its course by casting off the deposit without, or with very little, general disturbance." But, he says, "In the majority of cases coming under medical recognition, the diphtheritis is not confined to the entrance of the vagina, but is found deep within the canal, covering the large or small lacerations of the os uteri, and within the cavity of the uterus itself. Here it occupies both the site of the placenta and the upper parts of the organ, and it is sometimes found exclusively here, and in no places accessible to the eye." He admits that, in many autopsies of women dying of puerperal fever, no diph-

theritic deposit has been found, but he asserts that, not only have the symptoms been present, but careful examination of the patient during life has shown the presence of the deposit. In explanation of this apparent contradiction, he asserts that "the diphtheritic deposit in many cases very quickly disappears, and especially when injections or caustics have been employed, while its consequences may persist and undergo further development. The diphtheritic process spreads rapidly from the genital organs, rarely toward the skin of the thigh and nates, more frequently into the urethra and rectum, if it has not already appeared there primarily; but its most common modes of spreading are, either by means of the connective tissue surrounding the vagina and neck of the uterus, by the mucous membrane of the tubes to the peritonæum, or by the lymphatics and veins—these various modes of extension being often combined with each other."

Next, as to the doctrines of Hervieux: He begins by asserting that there is no puerperal fever, in the sense in which the word is ordinarily used, and he adds: "The admission of this seductive and convenient hypothesis is chaos, it is a return to the infancy of art; it is a negation of all diagnostic science; it is an obstacle to all therapeutic progress in every thing that concerns the puerperal maladies." He then very superficially and imperfectly examines some of the arguments which have been urged to support the theory of an essential puerperal fever. He also rejects the doctrine of traumatism, and of purulent, and of putrid infection, which he thinks is overthrown by the numerous incontestable facts that the disease is developed before and during labor.

He believes that there is a plurality of puerperal

diseases, as numerous as the local lesions, each of a distinct character, but developed by, and taking their special type from, what he terms *puerperal poison*, a miasm of lying-in hospitals, which, like the miasm of camps, and like the miasm of the surgical wards of a hospital, can engender numerous and very different diseases. These, originating from the same source, proceeding from the same cause, remain none the less as essentially distinct morbid entities. He asserts that, from this puerperal poison, not only originate phlebitis, peritonitis, and purulent infection, but that it equally is the source which develops scarlatina, erysipelas, pleurisy, pneumonia, cerebral hemorrhage, and many other affections which he could cite. He divides the causes of this puerperal poisoning into the general or determining causes, and the individual or predisposing causes. He enumerates, as the general causes of puerperal poisoning, atmospheric influences, vitiation of the air in the lying-in wards, the crowding of patients together, infection, and contagion. The individual causes which engender puerperal poisoning are, physical or moral distress, want of acclimation in hospital air, constitutional and antecedent diseases, first labors, and obstetrical operations.

In short, the theory of Hervieux is, that there is a puerperal poison, a peculiar miasm, which engenders peritonitis, phlebitis, metritis, and a multiplicity of other puerperal diseases, just as the miasm of camps causes typhus and typhoid fevers, dysentery, and purulent infection, just as the miasm of surgical wards gives rise to erysipelas, to phlebitis, to purulent infection, and to hospital gangrene, and just as the miasm of hospitals for children determines ophthalmias, erysipelas, diarrhœas, purulent pleurisies, purulent peritonitis, and diphtheria.

I have thus endeavored to give you a true and just idea of the numerous theories, in regard to puerperal fever, in vogue at the present day, and I have aimed to represent these theories without prejudice or partisan coloring, and to do justice to the arguments by which they are supported. I shall now give you my own views in regard to each of these theories, and my reasons for the opinions which I hold. At the same time, I warn you not to accept the doctrines which I teach, unless the arguments with which I support them convince your judgment. Where conflicting theories exist in regard to medical subjects, you should cultivate the habit of looking on all sides of the question, of broadly examining all the arguments for and against every given theory, and then form your own distinctive personal conclusions and opinions. There is no greater barrier to the progress of medical science than the professional habit of accepting the opinions of medical authors and teachers simply because they are regarded as authorities.

Now, let us first examine the theory of the *localists*. I shall here reproduce the arguments which I made use of in the discussion of this subject, before the Academy of Medicine in this city, sixteen years ago. For, with the most anxious desire for truth, the conscientious study of this disease, in seven epidemics which we have had in this hospital since that time, has only confirmed me in the opinions that I then expressed. I object to the theory that the disease is primarily a local inflammation, and that the fever and the general symptoms are secondary to, and the consequence of, these local inflammations:

(1.) That puerperal fever has no characteristic anatomical lesions. There is a great variety of structural

lesions found, the most frequent of which are those of the peritonæum, those of the veins of the uterus, those of the inner surface of the uterus, and those of the lymphatics. But these lesions are not uniform or constant. In the same epidemic, we have the greatest variety in their seat and their degree. In another epidemic, all lesions of the pelvic tissues are absent, and the lesions are chiefly of the thoracic organs. We find an entire absence of lesions of the peritonæum, of the uterus, or the uterine sinuses, or the ovaries, or the broad ligaments, but we find the same kind of pathological lesions in the pleura and pericardium as are seen upon the peritonæum when the lesions are manifested there.

(2.) These lesions are often not sufficient to influence the progress of the disease, or to explain the cause of death. The most malignant form of the disease, that in which a fatal result occurs the most speedily, offers the fewest and the least striking structural lesions. The longer the disease continues, the more prominent and the more manifest are the organic lesions. This would seem to prove that the lesions are consecutive or secondary; and that there is a primary disease, an original cause of vital depression, which sometimes destroys life so rapidly that there is no time for the development of the secondary morbid alterations. The cases are not very infrequent in which patients have manifested the first symptoms, and died within thirty-six or forty-eight hours; and, in these instances, the anatomical lesions are so few or so slight, that many have been reported by such observers as Gooch, Simpson, Locock, Tessier, Bourdon, Bouchut, Voillemier, Tonnellé, and others whom I could name, as cases of puerperal fever without lesion. I have seen several such in this hospital. It is character-

istic of those authors who belong to the school of localists, and who have studied the disease in one locality alone, or in one epidemic, to assume that certain lesions uniformly belong to it, and they modestly tell us that those who do not find them are either incompetent or imperfect observers. With this class, two or three drops of pus found in the sides of the uterus, near the attachment of the tubes, or of the broad ligaments, in a patient who has died after three or four days' illness, is a triumphant demonstration that the fatal disease had a local origin.

(3.) There may be inflammation, even to an intense degree, of any of the organs in which the principal lesions of puerperal fever are found, and yet the disease will lack some of the essential characteristics of puerperal fever. I mean to say that there may be peritonitis, phlebitis, or metritis, in the puerperal woman, and yet the disease may be quite distinct in its mode of attack, in its symptoms, and its pathological anatomy, from puerperal fever. Take peritonitis, for example. It may be excited by a difficult and protracted labor, by improper exposure, and by other well-known exciting causes. But puerperal fever, with the peritoneal lesion, may attack the patient after the most favorable delivery, and without any obvious cause. Then the symptoms of the disease show that it has a special character, for, in the puerperal fever with the peritoneal lesion, the symptoms of the first stage of peritonitis are generally absent; the peritoneal symptoms are those of the second stage, or of collapse, as, for example, there is very frequently diarrhœa instead of obstinate constipation. In peritonitis, the pulse, respiration, and temperature correspond in character with the local symptoms, the two former increasing in frequency, and the tempera-

ture rising, as the local symptoms increase, diminishing as they disappear. So I might take up in turn each one of the local inflammations which occur as idiopathic diseases in the puerperal woman, and point out the difference, in the mode of attack, the symptoms, and the progress of the disease, between these affections, which follow the laws of ordinary inflammations, and the lesions of the same tissues, the pseudo-inflammations of puerperal fever.

(4.) The lesions of puerperal fever are essentially different from spontaneous, or idiopathic inflammations of the tissues where these lesions are found. In the *Dublin Quarterly Journal of Medical Science*, August, 1857, you will find these distinctions most clearly described by Dr. Murphy, formerly Professor of Midwifery in the University of London; and the difference between the lesions of puerperal fever and those of simple inflammation were also noted as early as 1787, by Dr. John Clarke, and, since that time, by many other observers. In idiopathic peritonitis in a puerperal woman, there is intense injection of the arterioles of the surface of the peritonæum, the intestines are streaked with bright scarlet lines, and there is an exudation of plastic lymph. The lymph poured out is adhesive, uniting the different parts of the intestines, like glue. The quantity effused is not great, and, being lodged in the pelvic cavity, may at first escape observation. In puerperal fever, it is generally the venous radicles which are injected, and hence the intestines have a livid hue, and the patches and streaks on the surface, instead of being of a scarlet color, have a dusky-red appearance. In puerperal fever, the exudation is very much less adhesive, and very much more abundant, often covering the fundus of the uterus, the intestines, the liver, and

the diaphragm, and frequently is found in the pleura. In idiopathic inflammations, the surface of the intestine on which the exudation has occurred is rough, while, in puerperal fever, the surface where the exudation is found is smooth. In both, there may be an effusion of sero-purulent fluid, but in this particular the measure and intensity of the morbid processes are marked by almost opposite results. In simple inflammation, the more intense the peritonitis, the greater the amount of the sero-purulent effusion. But, in puerperal fever, the more intense and violent the seizure, the less the chance of meeting any lymph, and the less the amount of the effusion. In the most intense forms, death may take place before any effusion occurs. When the disease is less severe, there may be found a large amount of serum, colored brown by blood, in the peritonæum and throughout the tissues. The effused lymph is of the same color, having no adhesion to the surface on which it lies, as if the fibrine of disorganized blood had been deposited there, or the same kind of lymph or fibrine is found, of a yellow color, with a quantity of sero-purulent fluid. In those cases where the constitution struggles successfully for a time against the fever, some adhesive lymph will be found, mixed with a large quantity of sero-purulent exudation.

I have taken up the peritoneal lesion, as being the most frequent and the most prominent in puerperal fever. I might go on and point out characteristic differences between the other lesions of this disease and simple inflammations in corresponding tissues, but, as these inflammations have already been fully discussed in former lectures, I think that this part of my argument requires no further illustration.

(5.) Puerperal fever is often communicable from one

patient to another, through the medium of a third party. This is not the fact in regard to simple inflammations in puerperal women. The question, whether puerperal fever be contagious, was long in dispute, but I think that the fact is no longer doubted by the profession in Great Britain and in this country. In regard to this point, Hervieux says:

"The direct proofs of the reality of contagion are not wanting, and, at this day, it ought to be superfluous to recall them. The belief in contagion is indeed universal. There is not a capital in Europe where the medical public does not accept this belief. Paris, it must be acknowledged, remained a long time, in respect to this question, behind the other scientific centres; but, to-day, there is not one among us who, even if unknown to himself, does not speak and act as if he were convinced of the power of contagion."

In Germany, there are, however, still to be found certain writers who, forming their opinions on this question from their own limited observation, and apparently ignorant of the facts which have been accumulated by others in proof of this doctrine, deny that puerperal fever is contagious. I do not purpose to argue this question now, but, if any of you have any doubts on this point, let me refer you to a small volume on "Puerperal Fever," by Professor Oliver Wendell Holmes, published by Ticknor and Fields, Boston, 1855, in which he has brought together such an array of facts bearing on this, and presented them in his own inimitable style, with such a logical force as must convince the most skeptical. I may add, that I think this little work ought to be in the hands of every man who practises midwifery, as the influence of it might be the means of protection for some of his patients. Professor Holmes

gives more than thirty different series of cases, with upward of two hundred and fifty sufferers, and one hundred and thirty deaths, as the result of his researches, in which the evidence seems conclusive that the disease was directly communicated through the medium of the physician or nurse. Since the publication of his book, in 1855, many other facts of the same kind have been published, and I could add largely to his numbers, from the private communications which I have received from physicians in this city, and from different parts of the country.

I wish you here to remark that the evidence of contagion is not based on observations made in hospitals, where the air has been vitiated by an accumulation of patients. All admit that the saturation of the air with the exhalations of surgical and puerperal patients is eminently toxic, and engenders erysipelas, purulent and putrid infection, and other assimilated affections. This source of disease, which has been termed *nosocomial malaria*, is undoubtedly one of the most efficient and frequent causes of the development of puerperal fever in hospitals, but the facts on which the doctrine of contagion and infection is based are drawn from private practice and largely from country practice, where nosocomial malaria can have no influence.

These, then, are my reasons for believing that puerperal fever is a distinct disease from the febrile reaction of inflammation of any of the tissues of the puerperal woman; and for believing that the anatomical lesions found in this disease bear the same relations to it as the pustules on the cutaneous surface bear to small-pox, as the chancres and buboes bear to the syphilitic diseases, as the morbid changes found in the Peyerian and solitary glands of the small intestines bear to typhus fever.

Let us next examine the doctrine of traumatism and septicæmia, and see whether this explain the phenomena of puerperal fever. I think not, for the following reasons:

(1.) The septicæmia-theory is incompatible with the authentic facts which demonstrate that puerperal fever is contagious and infectious. Those who believe that puerperal fever is identical with septicæmia deny that the disease is really contagious, although they admit that it is "manually transferable." Now, I shall mention two facts, which alone seem to me sufficient to establish the distinction between puerperal fever and septicæmia:

It has often occurred that one physician is tracked by puerperal fever, following a series of labors, while, in the same neighborhood, village, or city, the disease is not met with in the practice of any other physician. Dr. Gordon's treatise on puerperal fever was published in 1795, and in this he says: "It is a disagreeable declaration for me to make, that I myself was the means of carrying the infection to a great number." He enumerates a number of instances in which the disease was conveyed by midwives and others to the neighboring villages, and declares that, "I arrived at that certainty in the matter, that I could venture to foretell what women would be affected with the disease, upon hearing by what midwife they were to be delivered, or by what nurse they were to be attended, during their lying-in, and, almost in every instance, my prediction was verified." In the essay on puerperal fever, by Dr. Armstrong, a number of instances are given of the prevalence of the disease among the patients of a single practitioner. In the town of Sunderland, England, there were in one year "forty-three cases of puer-

peral fever, and of this number forty were witnessed by Mr. Gregson and his assistant Mr. Gregory, the other three having been separately seen by three accoucheurs." In the essay of Dr. Gooch, on this disease, he says: "It is not uncommon for the greater number of cases to occur in the practice of one man, while the other practitioners of the same neighborhood, who are not more skillful or more busy, meet with few or none," and he gives several illustrations of this fact. Dr. Ramsbotham asserted, in a lecture on this subject, that "he had known the disease spread through a particular district, or be confined to the practice of a particular person, almost every patient being attacked with it, while others had not a single case." In the *London Medical Gazette*, for January, 1840, Mr. Roberton, of Manchester, makes the following statement, which I give as condensed by Dr. Holmes:

"A midwife delivered a woman on the 4th of December, 1830, who died soon after with the symptoms of puerperal fever. In one month from this date the same woman delivered thirty women, residing in different parts of an extensive suburb, of which number sixteen caught the disease and all died. The other midwives, connected with the same charitable institution as the woman already mentioned, are twenty-five in number, and deliver, on an average, ninety a week, or about three hundred and sixty a month. None of these women had a case of puerperal fever. Yet all this time this woman was crossing the other midwives in every direction, scores of the patients of the charity being delivered by them in the very same quarters where her cases of fever were happening."

At a meeting of the Royal Medical and Chirurgical Society of London, Dr. King mentioned that a practi

tioner at Woolwich lost sixteen patients from puerperal fever in one year. He was compelled to give up practice, his business being divided among the neighboring practitioners. No case of puerperal fever occurred afterward, neither had any of the neighboring surgeons any cases of this disease.

In different parts of the United States, both in the country and in cities, numerous instances have been published, where a series of cases of this disease has occurred in the practice of one man, while the other physicians in his vicinity have not had a case. Many such have been communicated to me, personally and by letter, from different members of the profession, but I need not multiply illustrations, as the number already published, amounting to hundreds, is sufficient to demonstrate the fact.

Septicæmia is very frequent in surgical practice, especially in hospitals, for I doubt whether it can be called a very frequent affection in country practice. The surgeon is constantly occupied with traumatic lesions, which offer a surface for the absorption of septic material much greater than ordinarily exists in the puerperal woman. I presume that no one will claim that surgeons, as a class, are more scrupulous, as to cleanliness and the use of disinfecting agents after exposure to septic materials, than obstetricians. But, after consultation with eminent surgeons in this country and in Europe, and from my own researches in medical literature, I am unable to find that a single instance has yet been published, where septicæmia has tracked the practice of one surgeon in any city or village, while the other surgeons in the same neighborhood did not meet with this affection. It seems to me that this one fact alone is sufficient to demonstrate that puer-

peral fever is not septicæmia. I concur with Schroeder, that septicæmia is "manually transferable," but that it is not contagious or infectious, and this is one of the proofs to my mind that puerperal fever is not septicæmia. In the discussion of the paper of Dr. Hicks, before the Obstetrical Society of London, to which I have before referred, Dr. Barnes, who regards septicæmia as one form of puerperal fever, remarked: "The autogenetic forms proper did not appear to possess active powers of propagation. For example, a common form, that which arose from decomposition of the placenta setting up septicæmic fever, generally began and ended in the patient attacked. It was not very liable to spread to others. So with other varieties of autogenetic puerperal fever." On this point, my own experience and observation are in entire accord with the remark of Dr. Barnes.

(2.) Puerperal fever differs from septicæmia in its origin, its mode of attack, and its symptoms. The former disease originates from epidemic causes, and from contagion and infection. The latter, from nosocomial malaria, from autogenetic infection, and from direct inoculation. The symptoms of the former are frequently manifested a day or two before, or during labor, even when the child is subsequently born alive. This fact has been noted by many observers, and I suppose that it must have been remarked by every one who has seen epidemics of this disease. But, in septicæmia, the symptoms are never observed before or during labor, except when the fœtus is putrid, as a traumatic lesion is a necessary element for the absorption of the septic material. I have already given you the symptoms of septicæmia in a former lecture on this subject, but I shall here remark that it is better for you not to be content with

my description, but that you should make a careful study of those German authorities who have devoted so much attention to this subject. Take, for example, the work of Billroth, which has been admirably translated, and compare his description of the symptoms of septicæmia with the symptoms of puerperal fever, as detailed by any competent observer of an epidemic of this disease, such as Campbell, Collins, Ferguson, or McClintock. I refer you to such as have described the disease from their own observation, rather than to the systematic writers, for the obvious reason that their description is unbiased by any theory of the disease. I think that no one can make this comparison without coming to the conclusion that Billroth describes a disease radically and essentially different from the one described by the authors that I have named. At the same time, you will please observe that I do not deny, on the contrary, I am quite convinced, that septicæmia not unfrequently occurs in connection with puerperal fever, more especially in hospitals.

(3.) That puerperal fever is not identical with septicæmia is demonstrated, also, by the difference in the influence of the two diseases on the infants of the mothers affected. There are two diseases which are extremely liable to occur in the infants of mothers suffering from puerperal fever. Erysipelas is the most frequent, and it proves fatal in a large majority of cases. In this hospital, it has been very common in several of the epidemics of puerperal fever. That the erysipelas is not developed exclusively by the vitiated air of hospitals, but is directly the result of the maternal disease, is evident from the fact that it occurs with great frequency in private practice in the infants of mothers suf-

fering from puerperal fever, who are surrounded by the most favorable hygienic conditions possible in a city. I have seen this in repeated instances, both in the country and in this city, and in families of wealth, where the greatest care was taken to prevent disease, by the removal and destruction of all sources of infection.

The other disease which has been frequently observed in connection with puerperal fever is, trismus nascentium. In one epidemic in this hospital, in 1867, one in every three children born in the hospital during one month died of trismus nascentium. The connection of this disease with puerperal fever has also been noted in other hospitals, as in the Lying-in Hospital of Dublin, in hospitals in London and in Stockholm. But in no instance that I have ever seen, or have ever found in medical literature, has the infant suffered from symptoms of septicæmia. My attention was called to this point by an incident which occurred during the month of May of the present year. I had a patient extremely ill with puerperal fever, one of the most severe cases that I ever saw recover. On the fifth day of her illness, her child was circumcised, and the child was apparently never ill in the slightest degree. This was to me a suggestive fact. That the infants of mothers suffering from puerperal fever are frequently infected, developing either erysipelas or trismus nascentium, is a well-known and accepted fact in medicine. I have never known an instance where the infant has been supposed to be infected by a mother suffering from autogenetic septicæmia; neither, after very considerable research, can I find that any such instance has ever been published. The traumatic lesions of a circumcised infant offer a greater exposed surface for the absorption of septic material than the lesions of most puerperal women. It

is incredible to suppose that all these circumcised infants are protected by greater precautions against septic absorption, than many mothers who get puerperal fever in a series of cases, from the attendance of one physician. I therefore made inquiries of such medical gentlemen in this city as had large experience in the observation of circumcised infants, and of such of our most eminent German practitioners as would be most likely to be thoroughly familiar with German medical literature, whether their own observation or medical literature furnished one single instance where a circumcised infant had septicæmia from suspected infection by the mother. The answer from every one was an unqualified negative. If, as the experimentalists and the advocates of the septicæmia-theory of puerperal fever tell us, an infinitesimal quantity of sepsine, less than a millionth part of a grain, be sufficient to infect, and if puerperal fever and septicæmia be identical, is it not reasonable to suppose that the infection of circumcised infants would have been observed, at least in a few instances, when we so often see infection of infants who do not offer this traumatic lesion, by mothers suffering from puerperal fever?

Departing from the order in which I have before mentioned the different theories of puerperal fever now in vogue, I shall next make a few comments on the theory of Hervieux, that there is a plurality of diseases which originate in puerperal poisoning. He admits that there are antecedent blood-changes, produced by the poison of miasm, and his plurality of diseases is the result of this primary affection. Wherein does this doctrine differ from the theory of a puerperal fever, which implies nothing more than the idea of a primary blood-disease that results in a great variety of local le-

sions? The answer of Hervieux is, that each of these local lesions is a "distinct morbid entity." By the same process of reasoning, it might be argued with equal force, that the paralysis which frequently occurs in diphtheria is a distinct morbid entity, that the albuminuria which so often results from scarlet fever is a distinct morbid entity, and so on, with numerous other affections, which, in the present state of science, are generally regarded as secondary lesions, when they are met with in zymotic diseases.

It seems to be the belief of Hervieux that, unless these secondary local affections be regarded as distinct diseases, there will be no diagnosis of their existence and no appropriate therapeutics. Now, is it true that this doctrine of Hervieux does tend to a more careful study of the symptoms and physical signs of these local lesions, than they receive from those who regard them as secondary affections, and that thus the science of diagnosis is advanced? And does this theory lead to better therapeutic results? I have failed to find any evidence which would justify an affirmative answer to either question. To parody a phrase from Hervieux, place the most ardent partisan of his hybrid localism, which is only one of the *débris* of Broussaisism, in presence of a severe case of puerperal fever which destroys life in two or three days, and would he be able to decide, by the symptoms and physical signs, whether the case were a peritonitis, a metritis, a lymphangeitis, or a phlebitis, and, when the autopsy reveals the fact that all these lesions existed, as they frequently do, would he say that the patient died from "four distinct morbid entities?" Carry this theory out to its logical conclusion, and you must admit as many distinct diseases as there are organs and tissues in which lesions are found.

As a rule, I have a great dislike to the *tu quoque* argument, but it is quite legitimate to judge of a theory, from its application by its originator. I may, therefore, with perfect propriety, refer you to the great work of Hervieux, as furnishing the strongest argument against his theory. You will find in this work numerous cases reported under the designation of one disease, which, from its symptoms and its necroscopic lesions, might, with equal significance, have been called one of two or three other diseases. For example, cases reported as peritonitis, both general and partial, might have been designated with equal truth as cases of ovaritis, or phlebitis, or metritis, for each of these lesions was found. In short, take out of his book many of his cases, in which the symptoms and the autopsical lesions are given, and it would be impossible for the best-instructed physician to determine in which of his distinct "morbid entities" Hervieux had classed them.

So, also, there is a great temptation to use the *tu quoque* argument in regard to the therapeutics of his work, but, if there be a class of what are called minds, that find in his new system of nomenclature, for it can hardly be called more than that, an evolution of science from chaos—an advance from the infancy of art—a progress in diagnostic accuracy and therapeutic success—further argument on this subject would be useless.

I have but a few words to say in regard to the theory of Professor Martin. The German writers seem to use the term diphtheria in a different sense from that accepted generally in the English language. Thus, the terms "diphtheritic membrane" and "croupy patches" are indifferently applied to describe the exudative covering which is often found on traumatic surfaces, especially in patients infected by nosocomial malaria. But, if

Professor Martin mean that puerperal fever is identical with the zymotic disease which we call diphtheria, it is a sufficient answer to his theory to mention the well-known fact that, for at least thirty years, diphtheria was an unknown disease in this country. It prevailed at irregular periods in different parts of the country, from 1771 to 1820. Then it seemed to entirely disappear, and there is no proof that the disease again occurred in any part of the country, until about 1856. But, during this time, there were many epidemics of puerperal fever. I have seen but one case of diphtheria in a puerperal woman, and this was in a patient of the late Professor C. R. Gilman. The disease commenced with high fever and delirium, and for a time it was supposed to be a case of puerperal fever, but subsequently the true nature of the disease became very evident.

Let us next examine the doctrines which have been previously referred to in my third and fourth classes. I shall discuss them together because, in reality, the essential difference between them is more in the use of terms than in pathological opinions. The one includes, in the term puerperal fever, all the puerperal diseases which are attended with fever, as all of the local inflammations, septicæmia, the exanthemata, and the idiopathic fevers. This class does not exclude the idea of an essential fever in puerperal women, but, in writers belonging to this school, you will frequently meet with an expression of regret that the term puerperal fever has been adopted in medical nomenclature, the reason assigned being that it is an unfortunate one, in that it is used loosely to include entirely distinct groups of disease. But those who make this complaint are the greatest sinners in this way, and confession with

them is not accompanied by repentance and reform. Let us see whether the objection rest on an essential foundation, or whether it be entirely of artificial creation.

It is in accordance with established usage in medical nomenclature, to designate the disease by the primary affection. If the disease be primarily local, the name of the disease is derived from the name of the organ involved. When inflammation of lung is accompanied with typhoid symptoms, it is often called typhoid pneumonia, but it is still pneumonia. If the lung become inflamed during the course of a typhoid fever, the disease is still called typhoid fever, and the pneumonia is regarded as secondary. No one would designate such a case as typhoid pneumonia. Pericarditis and endocarditis occur as primary idiopathic diseases, but, when either is developed in the course of an attack of rheumatism, the disease is still rheumatism, and the cardiac affection is considered secondary. Gastritis is often a primary disease, but, when it is caused by arsenic, the case would not be reported as one of gastritis, but as a case of arsenical poisoning. I might give numerous other illustrations to prove that, when the symptoms of general or constitutional disturbance are the consequence of a primary local affection, it is the organ affected which gives the name to the disease. But, when general disease precedes the local affection, the name is characterized by some feature belonging to the general disease. Now, in the puerperal woman, local inflammations frequently arise and cause severe constitutional disturbances, but the disease, under these circumstances, should be called peritonitis, metritis, or phlebitis, as the case may be; or, if two or more tissues or organs be involved, it is strictly correct to give the name which

will best express the fact, as metro-phlebitis, or metro-peritonitis.

The accepted doctrine of the present day is, that the general diseases are chiefly due to certain known and unknown blood-changes. When the cause of these blood-changes is known, the name of the disease is derived from this cause. Thus the disease which is recognized by a certain group of symptoms, and which is known to be due to an accumulation of urea in the blood, is called uræmia. The disease resulting from putrid infection is called septicæmia, and that which is produced by purulent infection is termed pyæmia. It seems to me incorrect to class these diseases among the fevers, and therefore those cases which Dr. Barnes would call autogenetic puerperal fever would be more properly named septicæmia.

The term fever, as used generically to designate a class of diseases, means a general disease which results from unknown blood-changes. It is called essential, because its characteristic symptoms are not due to a local cause.

All of the fevers have certain phenomena in common, which serve to distinguish the disease as a fever. Almost without exception, the development of a fever is manifested by a chill, and, in some instances, by rigors. Invariably there is a rise in the temperature, as shown by the thermometer. This is usually attended with lassitude, restlessness, imperfect sleep, and often with pain in the limbs, the back, or the head. The organic functions are also more or less disturbed. The appetite is lost, there is often nausea, and, in some fevers, vomiting. Thirst is also a very characteristic symptom, and there is generally a diminished secretion of urine. Now, when there is this aggregation of symptoms, without

any local disease to cause them, we are warranted in calling the disease a fever. Fordyce, whose work on this subject is still classical, defines fever "as a disease which affects the whole system. It affects the head, the trunk, and the extremities. It affects the circulation, the absorption, and nervous system. It affects the skin, muscular fibres, and the membranes. It affects the body and it affects likewise the mind. It is, therefore, a disease of the whole system in every kind of sense."

I shall now make my confession of faith in the following propositions:

1. There is a fever which is peculiar to puerperal women, and is, therefore, appropriately named puerperal fever.

2. The symptoms of this disease are essential and are not the consequence of any local lesions, and it is as much a distinct disease as typhus fever, typhoid fever, or relapsing fever.

3. It belongs to the class of zymotic diseases, and results from some unknown blood-changes.

4. We are as ignorant of the specific cause of these blood-changes as we are of those which develop relapsing fever, scarlet fever, or any of the other essential fevers.

5. The determining cause of this fever may be either epidemic influences, contagion, infection, or, probably, nosocomial malaria.

6. Any of the local inflammations may occur in the puerperal woman without puerperal fever; and, on the other hand, puerperal fever may be so severe as to destroy life without sufficient local disease to account for the symptoms or explain the cause of death.

7. The specific causes which develop the exanthemata, such as scarlet fever and small-pox, may develop

the specific disease with intense malignancy in the puerperal woman; but this does not transform the disease into a puerperal fever.

8. Septicæmia may be developed in a puerperal woman, either from autogenetic or heterogenetic infection, without puerperal fever, but this infection may also complicate puerperal fever.

LECTURE XX.

PUERPERAL FEVER.

Symptoms of puerperal fever—Anatomical lesions—Symptoms due to the secondary lesions—Progress and termination—Symptoms indicating the probability of recovery—Unfavorable symptoms—Treatment—Arterial sedatives—Necessity for careful watching—Case illustrative of the action of the veratrum viride—Opiates—Agents to reduce fever—Quinine—The mineral acids—Alcohol—Food—Treatment of the secondary lesions—Illustrative case—Treatment by elimination—Venesection (?)—Leeches (?)—Emetics (?)—Purgatives (?)—Mercurials (?).

GENTLEMEN: In all zymotic diseases, the symptoms vary greatly in different epidemics, and this is peculiarly the fact in regard to puerperal fever. I shall aim in this lecture to describe the symptoms which generally characterize this disease, and to point out the various modifications which result from epidemic influences, and the peculiar types of secondary lesions.

In a large majority of cases, the first symptoms of puerperal fever are manifested between the first and the third day after delivery. I have before mentioned the fact that the disease is sometimes developed a day or two before, or during labor. It rarely appears after the fifth day from delivery, and I have never met with a case in which the disease has come on after the eighth day.

During an epidemic, an experienced eye will often detect certain indications of the approach of the dis-

ease, in the aspect of the patient, some hours before its invasion. I have often remarked the haggard countenance, the trembling lips, the paleness of the cheeks, the wandering eyes, the vague answers, and the air of undefined suffering, before the appearance of other symptoms, and before the patients would make any complaints. I observed these appearances in one of my patients, whom I visited at six in the evening of the second day after delivery. The pulse was 84, the temperature 99°, and the patient declared that she was feeling perfectly well. But her appearance caused me such anxiety that I called again at ten, making a frivolous excuse for the call, so as not to excite alarm. I then found her with a pulse of 124, and a temperature of 102°, but she still could not be induced to make a complaint. I left her room, but not the house, mentally resolving not to do so for that night. Less than an hour from that time, the nurse rushed downstairs, requesting that I should be sent for at once. For the four days following, it was very doubtful how this case would terminate.

The first symptom, in most cases, is a chill, but this is sometimes so slight as to pass unnoticed, unless special inquiry be made in regard to it. But in many cases the chill is severe, lasting a half-hour, or even longer. The chill very rarely recurs a second time, and, when it does for two or three times, you have strong reasons for believing that the fever is complicated with suppurative phlebitis or with pyæmia.

In most cases, soon after the chill, there is a sudden development of abdominal pains, often vague and undetermined as to their seat, but generally beginning in the hypogastrium. This symptom is very rarely absent. I have been very much impressed by the fact

that, even in those epidemics that I have seen in which the secondary lesions were chiefly thoracic, the abdominal pains were almost invariably present in the *début* of the disease. I have also observed, in several instances, that this symptom was much less prominent when the disease was associated with septicæmia. As I have before told you, the abdominal pains seldom occur in autogenetic septicæmia.

The abdominal walls are generally soft and yielding, and abdominal distention is not a very marked symptom. Even when the secondary peritoneal lesions are the most prominent, the tympanites, the tenderness, and the pain, are much less striking than in idiopathic peritonitis. Patients are generally able to lie indifferently on the sides, or on the back, with the legs extended. In puerperal fever, when the disease approaches a fatal termination, there is often a rapid distention of the abdomen, due to an accumulation of gas in the intestines.

The temperature is always from three to six degrees higher than the normal standard, and my observations lead me to the conclusion that the oscillations of the thermometer are increased in a very remarkable degree when the disease is associated with pyæmia, and that the range is decidedly higher when it is complicated with septicæmia.

A constant symptom in this disease is a great frequency of the pulse. I should say the pulse is never below 110, and frequently is as high as 160. During the time of the chill, the pulse is small and quick, but, after the chill has passed off, the pulse becomes fuller, without increase of force, so that it is easily compressed by the finger. It is often irregular, and, as death approaches, it becomes very frequent, irregular, and thread-like.

The respiration is always hurried in this disease, the inspirations being from 24 to 50 or 60 a minute. In some cases during the epidemic of this spring, the rapid breathing was one of the earliest symptoms, preceding, in a few cases, the chill and the abdominal pains.

The tongue is generally moist, with a whitish coat, and it is often indented by the teeth. It is only dry and cracked in those cases where the patient breathes with the mouth open, on account of the difficulty of respiration.

The cerebral disturbances in this disease are not usually very marked. There is frequently some delirium, especially during the night, when the patient has hallucinations, cries out, and sometimes tries to get out of bed. But she is generally tranquil during the day, and quite forgets the excitement of the night. I have, however, in several instances, seen violent mania developed during the course of the disease, and the patients have apparently died from the exhaustion which results from the maniacal excitement. In such cases, when I have had an opportunity of making an autopsy, no lesions of the brain or of its meninges have been found.

Vomiting is rather a common symptom, the matter ejected being of a dark, greenish color, and containing a large quantity of bile. In quite a number of instances, both in this hospital and in private practice, lumbricoid worms have been vomited. Hiccough is also a frequent symptom in grave cases.

Diarrhœa is also very common, and sometimes the vomiting seems to be supplanted by the diarrhœa, but very rarely do the two symptoms occur at the same time, even in very severe cases. I have known both of these symptoms to be absent during the whole course of the disease.

The character of the lochial discharge furnishes no evidence in regard either to the existence or the intensity of the disease. Schroeder, who believes puerperal fever to be a disease entirely resulting from the absorption of septic material, remarks: "The discharge of fetid decomposed lochia is not, and cannot be, considered a proof that infection has taken place. We have often had the opportunity of observing that, within a few days after delivery, large quantities of foul-smelling lochia have been discharged, without there being any trace of disease. Decomposition of the lochia almost always takes place when large shreds of the decidua, partly separated from their connection with the surface of the uterus, have remained behind in the uterine cavity."

On the other hand, the remains of the placenta are not unfrequently retained for days and weeks, without any putrid decomposition taking place, or any symptoms of puerperal fever appearing. In fact, it often seems that the only symptom which results from this retention is repeated hemorrhage.

In puerperal fever, the lochial discharge often diminishes immediately after the invasion of the disease, and, after a day or two, nearly or quite disappears. In other cases, it increases in quantity and changes in character, becoming either more sanguinolent or more purulent. In some cases, the odor is very fetid, in others, not at all so. In other cases, again, I have seen the disease go on to a fatal termination without apparently affecting the lochial discharge, either as to quantity, quality, or duration. I may also add that I have repeatedly observed all of these varieties as to the lochia, in the same epidemic.

I must also remark that the disease seems to have no constant influence on the function of lactation. In

most cases, the invasion is manifested before this function is established, and, in a majority of such cases, there is usually very little secretion of milk, and, when there is, it ceases after two or three days. In a small number, I have seen lactation established and continue throughout the disease. In a number, so few that I must regard them as exceptional, I have seen this function developed or restored after convalescence.

There has recently appeared a very interesting essay by Dr. Eugène Quinquaud, of Paris, on "Puerpérisme Infectieux," a new term, which the author proposes to substitute for puerperal fever. The special feature of this essay is a study of the influence of this disease on the amount of the urea and of the chlorides eliminated in the urine. I have not yet had the opportunity to form any opinion as to the utility or value of this study, but I welcome all honest work which adds to our knowledge of the phenomena of any of the essential diseases.

If, now, it may seem to any of you that I have not given any positive, definite symptom by which puerperal fever may be recognized, it must be remembered that there are no pathognomonic symptoms of any of the essential diseases, with the exception of the exanthemata, and these can hardly be called exceptions. All admit that small-pox or scarlet fever may occur and destroy life, without the pathognomonic cutaneous lesions. Puerperal fever, like typhus fever, typhoid fever, relapsing fever, and all the essential diseases, is only known by a general combination of phenomena, nor is the presence or absence of any one symptom sufficient to determine the existence or non-existence of the disease.

I shall next call your attention to some special symptoms which result from the modifications of the disease, either by epidemic influences or by individualism.

Epidemic influences seem to determine the special character of the secondary lesions, and, of course, the symptoms which attend these lesions. Although, in the same epidemic, there is the greatest variety in their seat and their extent, yet certain epidemics of puerperal fever manifest a special tendency to the peritoneal lesions, others to the uterine tissues, others to phlebitis, to embolism, or to pyæmia, and, in other epidemics, we find very few lesions of the pelvic tissues, but these are chiefly observed in the thoracic viscera. Again, in other epidemics, the special tendency seems to be to septicæmia.

M. Charrier describes one epidemic at the *Hôpital Lariboisière*, in which the first half of the cases was characterized by peritoneal lesions, while, in the second half, lesions of the pleura were the uniform rule, and it was rare that lesions were found of any of the organs specially associated with parturition. M. Dubois observed one epidemic in which all who died were found to have perforation of the intestines. M. Danyau, in enother epidemic, found a constant alteration of the mucous membrane of the large intestine in its whole extent, the lesion being a solution of continuity, as if made by a punch.

I have, in former lectures, so fully discussed these lesions when they occur as idiopathic inflammations, that it is unnecessary for me now to do more than describe the difference in the local symptoms, when these lesions are secondary.

When the peritoneal lesions predominate, there is generally pain, which commences in the hypogastrium or in one of the iliac regions, and gradually radiates over the abdomen. The pain is, in some cases, slight, and in others, severe; in some it is continuous, and in

others it returns in paroxysms. The intensity or the continuity of the pain cannot be relied upon as a measure of the extent or the degree of the peritoneal lesion. In many cases, where the autopsy has revealed the most remarkable peritoneal lesions, there was neither pain nor tenderness. There was no pain in nineteen of one hundred and seventy-three cases analyzed by Ferguson, and in eight of thirty-three cases reported by Dr. Robert Lee. It seems, also, that the most fatal cases are those in which pain is absent.

The abdomen usually becomes distended and tympanitic when the peritoneal lesion occurs, but in a much less degree than in idiopathic peritonitis. In puerperal fever, the morbid sensibility of the abdomen is so moderate as to permit us often to determine by percussion the presence of effusion, which rarely is possible in idiopathic peritonitis. Diarrhœa is also a much more frequent symptom when this lesion is secondary. The dejections are sometimes involuntary, and they are usually dark and fetid when the disease is of a very grave character.

When the uterine lesions are the most prominent, in addition to the general symptoms of puerperal fever, there is usually a certain amount of pain in the region of the uterus, but this is often not very marked, except when pressure is made over the pubes or the sides of the uterus. The process of involution is retarded or arrested, and the uterus remains larger, harder, and more sensitive, than usual. There is generally suppression of the lochia, except in those cases where the chief seat of the lesions is the internal surface of the uterus. Then the lochial discharge is often greater than usual, and, at an earlier period than usual, it becomes purulent. If subsequently the lochial discharge become very profuse

and fetid, we have strong grounds for inferring that the endometritis has gone on to putrescence or necrobiosis. With this lesion, there is often difficulty in passing water, and sometimes very distressing strangury.

The local symptoms indicative of lesions of the uterine veins are less marked and striking than those that I have before mentioned. There is generally more or less pain in the uterine region. Professor Béhier insists that one physical sign of this lesion is always present. He asserts that, if the bladder be empty and the uterus be firmly secured in a fixed position by one hand, by compression of the sides of the uterus between the thumb and two fingers of the other hand, a painful, cord-like induration is found on one or the other side of the uterus near the attachment of the placenta, or extending to one or the other iliac fossa. Béhier affirms that this sign may always be found, and that it constantly exists antecedently to the other symptoms. I regard it as an important sign, but in no degree pathognomonic of uterine phlebitis, for I have often pointed it out to my hospital staff, and in some cases where no autopsical lesions of the veins were found. I think that, with the phlebitic lesions, there is generally more headache, more cerebral disturbances, greater thirst, and greater nervous depression, as manifested by muscular tremblings of the face and extremities, than is usually observed with the other secondary affections. Most writers seem to think that phlebitis is generally attended with recurrent chills, and it certainly is so, when this affection is associated with purulent infection.

There are no peculiar symptoms which characterize the lesions of the broad ligaments and of the ovaries, and it is only by an intelligent and experienced physical exploration that their existence can be determined.

The secondary thoracic affections will be made out by a careful study of the objective symptoms, and by percussion and auscultation. I have before discussed these points in my remarks on pyæmia, and I shall, therefore, not go over the ground again.

Septicæmia, as a secondary affection in puerperal fever, is usually a result of endometric lesions. Primary or autogenetic septicæmia is developed at an early period after delivery. The secondary septicæmia of puerperal fever may not be developed until the fever has existed for one or two weeks, and, indeed, I have seen cases where the characteristic phenomena of this infection have not appeared until the third week. Then the intellectual apathy and apparent dullness of sensation, the tendency to a semi-coma, the dry, hard tongue, the indistinct articulation, the subsultus, the profuse sweating, sometimes alternating with a very dry skin, the persistent diarrhœa with excessively fetid discharges, the cold extremities and the irregular, thread-like pulse, are such a combination of phenomena as leave no doubt as to the nature of the infection.

Pyæmia is a secondary affection of a late period of the disease. The recurrent chills, followed by fever and perspirations, the suppurations of subcutaneous cellular tissue, the effusion in the articulations, the rational symptoms and physical signs of pneumonic inflammations or of purulent effusion in the pleura and the pericardium, and the character of the urine, are phenomena sufficiently characteristic to establish the nature of the secondary affection.

Puerperal fever is a disease which produces its effects very rapidly. Fatal cases ordinarily terminate between the second and the sixth day of the disease. In severe epidemics, the majority of deaths occur on the fourth

and fifth days, but there are usually a few patients who die within forty-eight hours from the time of the attack. In such cases, the chill, the abdominal pains, the vomiting and diarrhœa, the hurried and labored respiration, the profuse perspirations, and the cold extremities, succeed each other so rapidly, that, from the commencement of the attack, it is plain to see that the disease must be inevitably fatal.

The French apply the term *foudroyant*, which literally signifies *thunder-striking*, *crushing*, to characterize overwhelming attacks of any disease, and it is so expressive that it has been adopted in English medical literature.

When death occurs later than the sixth day, it usually results from some of the secondary affections.

Recoveries are also sometimes very rapid. We occasionally meet with cases very formidable in the beginning, that are thoroughly convalescent in four or five days. But much more frequently the recovery is very slow. The abdominal pains disappear, and are renewed again and again. The pulse, the temperature, the tympanites, and all the other symptoms, are found much better one day and worse the next, and often without the manifestation of any new secondary affection, or any other assignable cause.

But, as a general rule, the convalescence is tedious in proportion to the extent and severity of the secondary affections. From three to four weeks is the usual time required for recovery, and I feel extremely well satisfied if patients are quite well at the end of the puerperal month. But it often happens that secondary affections of the pelvic organs, or extensive suppurations of subcutaneous cellular tissue, or some of the thoracic affections, may require weeks for their cure and disappearance.

I shall first mention the symptoms which indicate a probability of recovery. Perhaps the most significant is a permanent decrease in the frequency of the pulse, coincident with a corresponding fall of temperature. If the pulse become less frequent while the temperature still remains above 103° or 104°, you must not anticipate a continuance of the improvement in the pulse. Furthermore, it is not safe to pronounce a decided improvement, unless the reduced frequency of pulse and fall of temperature have continued for twenty-four hours. I have seen the pulse brought down below 80 by the veratrum viride, and the temperature reduced to 100° or 101° by quinine, and a few hours afterward I have found the pulse as frequent and the temperature as high as ever before. The effects of the therapeutic agents seemed to be for a time overcome by a new invasion of the disease. This has been again controlled by the vascular sedative and the antipyretic, until at last a permanent effect is secured.

Another favorable symptom is the disappearance of the abdominal pain, coincident with subsidence of abdominal distention, but its cessation is no proof of radical improvement, except when, at the same time, the tenderness on pressure and the tympanites decrease in a corresponding degree.

Cessation of vomiting, if it be not replaced by exhausting diarrhœa, is also a favorable omen. A moderate diarrhœa appearing late in the disease, in my observation, is usually followed by improvement. Patients frequently express themselves as feeling better after each discharge, and, unless the number of these exceed three or four a day, I do not attempt to arrest them.

I usually look upon the appearance of external suppurations, such as abscess of the breast, or of the nates,

or of the extremities, as favorable. I have frequently observed that a decided improvement in the general symptoms corresponds with the development of these abscesses.

I am also very much inclined to look upon the appearance of herpes labialis as a good symptom, indicative of an eliminative process, as I have several times remarked that a manifest improvement has commenced in patients who were very ill, about the same time as the appearance of this eruption.

It is hardly necessary for me to enumerate, as favorable symptoms, an increased demand and capacity for food, a clearing up and a brightening of the intellectual faculties, and a cheerful, hopeful *morale*.

I have before alluded to a combination of symptoms which are usually observed in those cases which prove rapidly fatal. I shall now point out those which indicate that the disease is very grave. I do not think that any conclusion can be drawn as to the prognosis in the case, from the violence or the duration of the initial chill, or from the severity of the abdominal pains, for I have seen as many fatal cases, which began with very slight chills and with but little complaint of abdominal pain, as I have of those in which these symptoms were very striking. The initial symptoms which to me are the most alarming, are a pulse above 140, a temperature above 104°, and a very rapid, laborious respiration. I regard the latter as the most significant and serious symptom of the three, when it appears very early in the disease, before it can be due to distention of the abdomen and mechanical interference with the action of the diaphragm, or before the development of the secondary thoracic affections. The symptom to which I refer will easily be discriminated from the rapid breathing which is caused by emotional excitement.

Severe diarrhœa, in the early period of the disease, is also a measure of the intensity of the attack. When both vomiting and diarrhœa occur together, and there are also a rapid pulse, high temperature, and hurried breathing, the prognosis is exceedingly grave. In such cases, you will usually observe, at a very early period, profuse sweats, cold extremities, and a very feeble, irregular pulse.

Subsidence of pain, while the abdominal distention is absolutely increasing, is a very unfavorable symptom.

Pyæmia or septicæmia is, of course, a very serious complication; but I am quite certain that it is a mistake to regard either as inevitably fatal. I am sure that I have seen recoveries when the existence of one or the other of these infections could not be doubted.

Purulent effusion in the great serous cavities, as the peritonæum, the pleura, or the pericardium, usually results in death.

The influence of mental depression in leading to a fatal termination has been remarked by nearly all writers on puerperal fever. Our four patients who have died in the present epidemic were all unmarried. Campbell says that, of eight unmarried mothers attacked by this disease, six died, and similar statements are made by Leake, Clarke, Armstrong, and Ferguson.

The development of mania in a patient with puerperal fever, in my experience, almost invariably leads to a fatal termination. I do not refer to the delirium, which, in a certain degree, very generally occurs in this disease, but to an absolute mania.

The treatment of puerperal fever is, perhaps, quite as unsettled as its pathology. I shall not attempt to give you the various methods which have been rec-

ommended by different writers, but I shall endeavor to point out those general principles which, in my estimation, should govern the treatment, with those special indications which arise from the peculiar character of the disease. I shall begin by observing that there are no specifics for puerperal fever, any more than for typhus fever, yellow fever, or relapsing fever. As has been before remarked, the type of the disease varies to an extraordinary degree in different epidemics, and there must be a corresponding variation in the treatment. This must also be modified in accordance with the individual conditions of the system, and with the extent and intensity of the secondary affections. There is no disease which requires more acute discrimination in the adaptation of means to an end; none which requires a sounder judgment or more incessant watching to combat every assault which may exhaust vital power. The leading indications are to allay and control the vital disturbances which the disease causes, and to combat the secondary affections which may result.

(1.) No argument is needed to convince you that the vital powers are rapidly exhausted by disease, when the heart is driving the blood through the system at the rate of 120 or 140 beats in a minute. It also must be evident that something is gained in prolonging or saving life, if arterial excitement can be reduced without loss of vital power. There are several agents which may be properly termed vascular sedatives, but the most efficient and certain of these are veratrum viride and aconite. Digitalis is usually regarded as belonging to this class, but there is a decided difference between the action of this agent and that of veratrum viride and aconite. The two latter will reduce the rapid pulse of inflammation and of irritation, but not the

quick pulse of exhaustion, while digitalis is less efficient as an arterial sedative in the former conditions, but it does steady and retard the quick pulse of exhaustion, and it is believed by many to act as a cardiac tonic. I have, in a former lecture, given my reasons for preferring the veratrum viride to any other agent, when the object is to reduce the frequency of the pulse. I find a great number of physicians who regard this article as unsafe and uncertain, because, if given in too large doses, it produces nausea and vomiting, and other symptoms resembling collapse. The pulse becomes very slow, the countenance pale, and the surface is cold and covered with a clammy sweat. These appearances very naturally cause alarm; but, after an experience of more than thirty years in the use of the veratrum, I feel warranted in asserting that these phenomena are really not dangerous. I have never known any serious result to follow from its use. This condition is purely temporary, and patients pass out of it in a short time, even if no restoratives be given. Diffusible stimulants, such as ammonia, wine, or brandy, will very soon bring the patients out of this apparent condition of collapse. Still, it is very desirable to avoid such explosions, by commencing the use of this medicine in small doses, carefully watching the effect and increasing the dose very gradually until a positive effect is produced on the pulse, on account of the alarm which they are apt to excite, not only with friends, but sometimes with the patient herself. When the frequency of the pulse is very decidedly reduced, the number of drops in each dose may generally be diminished, but yet the effect must be kept up for several days after all suspicious symptoms have disappeared. Over and over again, I have seen the mistake made of stopping the

veratrum viride too early; and thus the disease has been allowed, as it were, to renew itself. I have found that this medicine is less apt to produce nausea if it be given with syrup or a few drops of the tincture of ginger in a little sugar and water. There is a notable difference in the strength of the tincture as it is found in the shops, and it is therefore wise to commence with small doses, increasing gradually, until you ascertain the quantity necessary to produce the specific effect on the pulse. The use of this drug is objected to by some, because it requires constant watching. But, to my mind, this is an argument in its favor. The disease itself demands constant watching; and no man should take charge of a case of puerperal fever, unless he be able to give it the most devoted attention and incessant care. Success in treating a severe case of this disease will turn, in a great measure, on the promptness with which each symptom is met, and, day and night, not only faithful but intelligent, educated vigilance is demanded. It is not safe, in this disease, to leave the patient in the hands of the best of nurses for many hours, unless an exceptional one be found, who is able to record the pulse, the respiration, and the temperature, and one, too, who never loses self-possession, and who has the intelligence and the judgment to comprehend and follow directions for such modification in the treatment as change in the symptoms may demand. Except with such a nurse, and there are but very few, I should not feel easy if I did not see a patient with puerperal fever three or four times a day, and I should not think of allowing a night to pass unless the patient were watched, either by myself or by some other physician.

I was recently in attendance on a very severe case

of puerperal fever. I had for two nights watched the patient myself, and a young medical friend of the family had remained with her for two other nights. I visited her one evening at eleven o'clock, thinking that she was so decidedly convalescent, that I might safely return to my own house and secure a good night of sleep. But, while detained below for a few moments, I took from the drawing-room table a book, the title of which I do not remember, but the author was Dean Alford, and my eye fell on the following sentences: "There are moments that are worth more than years. A sick man may have the unwearied attendance of his physician for weeks, and then may perish in a minute because he is not by." On going to the room of my patient, I found her condition in every respect satisfactory. Her temperature was 102°, it had been 105°; her pulse was 92, and she expressed herself as feeling perfectly well, and a solicitude that I should have a good night's rest. But the words I had just read were burned in my mind. When I went down-stairs, I said to her husband, "Your wife appears to be doing well in every respect, and I have taken leave for the night of all up-stairs, but I think that I shall get more refreshing sleep on the sofa in this room than in my bed at home." Between one and two o'clock, I was awakened by a commotion in the room above. I found my patient very excited, complaining of intense pain in the hypogastrium, with a pulse of 144, and a temperature of 105.4°. The nurse had put a bedpan under her, to enable her to empty the bladder, when she suddenly screamed out with pain. I at once gave hypodermically fifteen drops of a solution of morphia (sixteen grains to the ounce of water), and then, as she complained greatly of pressure in the bladder, I introduced the

catheter and drew off about ten ounces of urine. The abdomen was then covered with hot turpentine-stupes. Ten drops of the solution of morphia were afterward twice administered hypodermically, at intervals of one hour, but it was six in the morning before my patient fell into a sound sleep. The two days following she remained so ill as to cause me great anxiety, but after this time her recovery was rapid. Now, if I had gone home, and the time required to get a carriage and send for me had been lost, it is my firm conviction that this lady would have died. With such physical symptoms as were suddenly developed in this patient, who will doubt that the influence of emotional excitement, continued for an hour, would have made the case perfectly hopeless? My immediate presence tranquillized both the family, who were excessively alarmed, and the patient.

In puerperal fever, I usually commence by giving five drops of the tincture of veratrum viride, every hour. If a decided impression be not made on the pulse after two or three doses, I increase each dose by one drop, until a positive effect is gained, and thus I seek to bring the pulse down from 120, 130, or 140, to below 80 In a large majority of cases, it can be brought down to this point, but, in some, it cannot be brought below 100. This is apt to be the case with very nervous patients. The influence of the veratrum viride should be steadily kept up until two or three days after all constitutional disturbance has subsided. After a little experience, you will learn just how many drops are necessary for this purpose in each patient. When the pulse is once reduced by the veratrum viride, usually two, three, or four drops, every second hour, will be sufficient. If vomiting come on, wait until the pulse begins to rise.

and then begin again with a minimum dose, but do not give up its use. Now, let me be understood on this point. I do not regard the veratrum viride as a specific remedy for puerperal fever, but I do consider it a very valuable and important agent for controlling vascular excitement, and believe that, by its use, cases have been cured, which, without it, would have terminated fatally.

In the following severe case, which occurred in this hospital, in 1857, and was reported by Dr. Cobb, then house physician, the veratrum viride was the only medicine used, and you will see, by the report, its influence in reducing the pulse. I should remark that the tincture then used was probably about half the strength of that now generally found in the shops:

Case XXXVI.—"Kate S——, aged twenty-three years, fell in labor in full term, at 2 o'clock P. M., February 25th, and was delivered of a healthy child at 8.12 o'clock on the morning of the 26th. Nothing unusual occurred in her labor, except that the second stage was somewhat prolonged. The placenta came away in due time, and was not followed by hemorrhage. First pregnancy.

"*February 28th.*—At 8 A. M., she was seized with a very severe chill, followed by increased frequency of the pulse, and pain over the hypogastric region, extending as high up as the umbilicus. This pain was very much increased by taking a full inspiration, or by pressure. Tympanites very considerable. The discharge, abundant and very offensive. Pulse 140, respiration 24.

"At 1 o'clock P. M., Dr. Barker saw her, and recommended that she be transferred to the fever-wards, and put on the use of the tinctura veratri viridis.

"At 2 o'clock P. M., after having been removed to the fever-wards, her pulse was 140, respiration 24. Pain over the hypogastric region intense. Tympanites very considerable. Lochia abundant and very offensive. No mammary secretion. Dr. Barker requested she should be seen hourly by one of the house staff, and that her condition, as to the state of the pulse, respiration, and other symptoms, and the dose of the veratrum viride given, should be recorded at each visit. The following is the record thus kept:

RECORD OF CASE.

TIME.	Pulse.	Resp.	Drops.	REMARKS.
February 28.				
2.00 P. M.....	140	24	10	
3.00 "	127	22	10	
5.00 "	140	22	10	
6.00 "	132	12	10	
7.00 "	120	20	10	
8.00 "	80	20	9	Bowels moved once.
9.00 "	75	16	..	Vomited a greenish-colored fluid. Bowels loose.
10.00 "	66	16	4	Vomiting ceased. Bowels moved once.
11.00 "	65	22	7	
12.00 "	58	13	2	
March 1.				
1.00 A. M.....	64	52	6	Respiration very irregular. Inclined to sleep.
2.00 "	58	25	2	Sleeping.
3.00 "	59	21	..	Hiccough and headache.
4.00 "	60	18	1	Hiccough still continues.
5.00 "	66	20	..	Severe headache. Vomited a greenish-colored fluid.
6.00 "	66	21		Headache severe, and very restless. Vomited several times within the last hour. Hiccough.
7.00 "	58	20	..	Vomited once since last visit. Vertigo and headache.
8.00 "	52	28	..	Sleeping.
9.00 "	60	19	..	
10.00 "	68	21	1	Slight hiccough.
11.00 "	70	23	2	
12.00 M.	80	28	3	Tenderness over abdomen marked. Tympanites somewhat diminished. Lochia dark, bloody, and very offensive.
1.00 P. M.....	80	20	4	Visit of Professor Barker.
2.00 "	92	24	8	
3.00 "	76	24	8	Face flushed.
4.00 "	76	28	9	Sleeping.
5.00 "	68	28	8	Sleeping.
6.00 "	66	28	8	
7.00 "	68	26	6	Slight hiccough. Bowels moved once.
8.00 "	66	18	..	Vomited a greenish-colored fluid.
9.00 "	68	24	..	Vomited once since last visit.
10.00 "	60	28	..	Sleeping.
11.00 "	64	28	..	Still sleeping.
12.00 "	66	28	2	Still sleeping.
March 2.				
1.00 A. M.....	56	32	..	
2.00 "	70	24	3	Complains of pain in left thigh. There is slight swelling, and, along its internal surface, over the veins and lymphatics, the tenderness is so great that she can scarcely bear the lightest touch. Tenderness over abdomen still continues. Slight tympanites. Lochia dark, profuse, and offensive.

RECORD OF CASE—(*Continued*).

TIME.	Pulse.	Resp.	Drops.	REMARKS.
March 2.				
3.00 A. M.....	76	24	4	No mammary secretion.
4.00 "	65	20	3	Sleeping.
5.00 "	78	22	8	
6.00 "	68	22	4	
8.00 "	64	24	4	
9.00 " ...	72	24	6	
10.00 "	64	28	2	Bowels moved once.
11.00 "	72	28	6	
12.00 M.	70	24	5	
1.00 P. M.....	64	24	3	
2.00 "	60	20	..	
3.00 "	64	24	..	
6.00 " .. .	68	28	3	
7.00 "	72	28	5	
9.00 "	80	28	6	Face flushed.
10.00 "	80	26	6	
11.00 "	80	28	8	
12.00 "	80	28	10	Sleeping.
March 3.				
1.00 A. M.....	80	29	..	Vaginal discharge now ceases to be offensive. No mammary secretion. Tympanites still remains. Tenderness over abdomen still continues, though not so well marked. Tenderness and swelling in left thigh still continue.
2.00 "	78	28	10	Slight hiccough.
3.00 "	80	28	8	
4.00 "	72	20	4	
5.00 "	68	28	..	Vomited a greenish-colored fluid.
6.00 "	64	24	..	Headache. Hiccough. Bowels moved twice.
8.00 "	60	24	..	
9.00 "	68	24	5	
10.00 " ...	70	24	3	
12.00 M.	72	28	6	
1.00 P. M.....	80	28	6	
2.00 "	80	22	8	
3.00 "	76	30	4	
4.00 "	76	26	5	Sleeping.
5.00 "	72	32	4	
7.00 "	64	32	2	
8.00 "	72	28	5	
9.00 "	68	30	4	
10.00 "	68	28	3	
11.00 "	72	28	5	
12.00 "	70	30	7	Sleeping.
March 4.				
1.00 A. M	72	32	8	Tenderness over abdomen not so intense. Slight tympanites. Vaginal discharge now appears to be natural. Tenderness and swelling on internal surface of left thigh now seem to be diminishing. No mammary secretion.
2.00 "	70	30	..	
3.00 "	64	28	2	

RECORD OF CASE—(*Continued*).

TIME.	Pulse.	Resp.	Drops.	REMARKS.
March 4.				
4.00 A. M.....	64	28	3	
5.00 "	60	24	2	
6.00 "	60	28	2	
7.00 "	60	28	2	Bowels moved twice.
8.00 "	58	28	..	
9.00 "	60	28	..	
10.00 "	56	28	2	
11.00 "	64	32	3	
12.00 M.	72	24	4	
1.00 P. M.....	78	32	6	
2.00 "	80	28	8	
3.00 "	80	24	8	
4.00 "	80	30	8	
5.00 "	80	28	8	Sleeping.
6.00 "	60	32	..	
7.00 "	64	24	6	
8.00 "	60	24	2	
9.00 "	60	28	2	
10.00 "	60	24	2	
11.00 "	60	26	..	
12.00 "	58	24	..	
March 5.				
1.00 A. M.....	60	22	3	She now says she feels much better. Her countenance looks much brighter, and she appears to be improved in every respect. The tenderness which has been so intense over the abdomen, now is scarcely noticeable. Tympanites very slight. Lochia very scanty, but normal. No mammary secretion. The swelling and tenderness on the internal surface of the thigh, in the course of the veins and lymphatics, have now disappeared altogether.
2.00 "	68	26	4	Sleeping.
3.00 "	60	22	2	
4.00 "	..	..	..	
5.00 "	..	..	..	
6.00 "	70	30	6	
7.00 "	64	24	4	
8.00 "	76	24	6	
9.00 "	76	24	6	
10.00 "	72	28	6	
11.00 "	64	24	3	
12.00 M.	68	24	6	
1.00 P. M.....	64	28	5	
2.00 "	..	..	..	
3.00 "	56	28	..	
4.00 "	..	..	..	
5.00 "	64	24	5	
6.00 "	..	..	..	
7.00 " ...	..	..	..	
8.00 "	68	26	4	
9.00 "	..	..	..	

RECORD OF CASE—(*Continued*).

TIME.	Pulse.	Resp.	Drops.	REMARKS.
March 5.				
10.00 P. M.....	72	24	4	
March 6.				
8.00 A. M.....	70	24	6	Feels well. Improvement marked. No tenderness on pressure over the abdomen. No tympanites. Lochia still scanty, but normal. Slight mammary secretion.
11.00 "	76	24	4	
12.00 M.	..	..	..	
1.00 P. M.....	72	24	..	
5.00 "	78	28	8	
6.00 "	..	..	..	
7.00 "	76	26	..	
8.00 "	..	..	..	
9.00 "	..	..	..	
10.00 "	72	24	4	
March 7.				
9.00 A. M.....	76	24	..	She says she feels well and hearty. No tenderness over the abdomen. No tympanites. Lochia healthy. No tenderness or swelling in left femoral region. Appetite good. Bowels regular.
March 8.				
10.00 A. M.....	76	24	..	Continues to improve very fast. From this time she continued to improve, and in a short time was discharged well.

It is as necessary to know when not to use the veratrum viride, as to know when to prescribe it. It should not be given in those cases in which rapid prostration is manifested by a feeble, thread-like, irregular pulse, profuse sweats, and cold extremities.

(2.) It is also very important, in this disease, to allay pain, quiet nervous irritation, and secure sleep. Opiates therefore are strongly indicated to a sufficient extent to accomplish these ends. When the disease is of the peritoneal type, the tolerance of opiates is sometimes quite remarkable, but still in a very much less degree than in those cases where peritonitis occurs as a primary disease. I generally use Magendie's solution of morphia (sulphate of morphia grs. xvj, water ℥j),

but, if the stomach be irritable, the morphia may be administered hypodermically. The patient should be carefully watched while under the influence of morphia, and the respiration should not be allowed to become slower than 12 or 14 in the minute. The morphia should be continued as long as the least sensitiveness to pressure or tympanites of the abdomen remains. Here also I have often seen the mistake made of giving up the morphia when it should have been continued two or three days longer.

(3.) The next indication is to reduce the fever. The danger in any case of puerperal fever is measured pretty accurately by the thermometer, and no patient with this disease can be regarded as safe while it ranges above 100°. At the present day, we no longer make use of those agents called antiphlogistics, to reduce fever, but we rely upon another class, which have been termed antipyretics. Quinine, the mineral acids, cold sponging, alcohol, and appropriate nutrition, are probably the most efficient antipyretics in puerperal fever. Quinine has been extolled by some as almost a specific in this disease, but I think that its real value lies in its effects as a means of allaying fever. This result is better attained by giving it in full doses, morning and evening, rather than in smaller doses, repeated several times a day. I generally find that, in this disease, from five to ten grains in the morning and from ten to fifteen in the evening are well borne, and rarely cause the cerebral symptoms of cinchonism. The mineral acids are also very useful as antipyretics. I am more in the habit of giving the phosphoric acid than any other, from the belief that it decidedly allays nervous irritability, and that it acts specifically as a nerve-tonic. A teaspoonful of the dilute phosphoric acid in a tumbler-

ful of water, with simple syrup or syrup of orange-peel, makes a very pleasant drink, which I allow patients to take *ad libitum*, and many take three or four tumblerfuls in the twenty-four hours. Some patients are disinclined to drink, and for them I have prescribed from ten to fifteen drops of dilute sulphuric acid in syrup and water, every two or three hours, with perhaps just as good results. Sponging with cold water and alcohol is another most efficient and grateful antipyretic, which I always direct should be used at least twice a day.

In a former lecture, I have discussed so fully the value of alcoholic stimulants in the treatment of puerperal diseases, that I shall only add now a few words in regard to their use in puerperal fever. They should be given so soon as feebleness of the pulse, clamminess of the surface, profuse perspirations, or cold extremities, are noticed. The special stimulant should be selected that is the most agreeable, or is the least distasteful to the patient. The quantity required will vary extremely in different cases, and will call for the exercise of sound judgment. The good effects of the stimulants are seen in the decrease in frequency and increase in force of the pulse, with often a reduction of temperature and subsidence of delirium. In some, a half an ounce or an ounce of brandy or whiskey, every four or six hours, may be all that is required, while, in extreme cases, I have often given with benefit an ounce or more every hour. The symptoms of intoxication should never be produced, and, when convalescence is established, the tolerance of stimulants rapidly decreases.

Another important point is nutrition. Even if there be a repugnance to food, owing either to a re-

luctance to be disturbed, or to want of taste and appetite, it should be deemed a part of the medical treatment, that as much food should be taken as can be retained, digested, and assimilated. It should be given at frequent intervals, in a liquid form in as large quantities as can be retained without vomiting or causing discomfort from over-accumulation or indigestion. The kind of food should be often varied, so that the patient may not become disgusted with any one article. Most nurses, and I am sorry to say a few doctors, are ignorant of the fact that a patient may starve with an abundance of beef-tea. A variety of elements is necessary for healthy alimentation, and the patient should have, in alternation, milk, eggs, gruels, beef-tea, mutton-broth, chicken-soup, some one of these every three or four hours during the day and two or three times during the night.

(4.) The next indication is to combat, by appropriate means, the various secondary local affections which may be developed. I trust that it is unnecessary for me to enter into any details on these points. If I have quite failed in giving clear expression to my views in former lectures, it will be useless for me now to point out to you the importance of antiseptic vaginal injections, or to tell you how and when intra-uterine injections are to be used, or to describe the indications for turpentine-stupes, blisters, and other treatment that may be necessary for the local lesions. Perhaps I shall best illustrate my idea of the way in which this disease should be managed by the report of a recent case in my private practice, in which the attack of puerperal fever was *foudroyant*. The report is made up from my own notes and those kept by Dr. A. A. Smith, to whom the patient is indebted for most careful and

intelligent watching, with the sacrifice of sleep for several nights, and I am indebted for most efficient aid in bringing the case to a successful termination:

Case XXXVII.—"Mrs. L——, aged twenty-six, primipara, who had been remarkably well during the whole period of gestation, was delivered, by forceps, of a fine, healthy boy, at 12 noon, May 4, 1873. The placenta followed in fifteen minutes, with sufficient but not excessive loss of blood. She slept for nearly an hour after labor was over, and then awoke, feeling very well, and took a large cupful of beef-tea. In the evening, she expressed herself as feeling well enough to go down-stairs to dinner. Pulse 84, temperature 98.5°.

"*May 5th.*—Visited her morning and evening. She has had no after-pains, the appetite is good, and her condition is normal in every respect. Morning, pulse 72, temperature 98.5°. Evening, pulse 84, temperature 99°.

"*May 6th.*—I was summoned to see her at 1½ A. M. She was awakened from sleep by a severe chill at 11½ P. M., which lasted nearly an hour. She complained of no pain, but was extremely nervous. On my arrival, I found her much agitated, breathing rapidly, the skin very hot, the face pale, with the exception of a dark-red circle, about the size of a quarter of a dollar, on each cheek. She declared that she was not alarmed; did not know what was the matter. There was no pain and no tenderness on pressure over any part of the abdomen. Compression of the sides of the uterus caused no expression of suffering. Pulse 154, temperature 105.5°, respiration 36. As soon as the medicines could be obtained, she commenced taking Magendie's solution of morphia, gtts. 10, and tincture of veratrum viride, gtts. 5, every hour. This was 3 A. M. At 7 A. M., she seemed very much inclined to sleep, and all nervous excitement had passed off. Pulse 136, temperature 105°. Magendie's solution, gtts. 3, tinc. verat. virid., gtts. 7, every hour. 10 A. M.—She has slept, except when roused to take medicine or food, since 7 o'clock. Respiration 15, pulse 120, temperature 105°. Omit morphia. To have varied liquid food every third hour. Tinct. verat. virid., gtts. 10, every hour. One dose of quinine, gr. 10, to be taken at once. 2 P. M.—Pulse 100, respiration 24, temperature 102.5°; is perspiring very freely. Magendie's solution, gtts. 3, tinct. verat. virid., gtts. 3, every hour. 5 P. M.—Complains of some pain and tenderness over the uterus for the first time. Pulse 120, perspiration 32, temperature 105°, skin dry. Magendie's solution and tinc. verat. virid., gtts. 5 each.

8 P. M.—Pain in abdomen very severe, and abdomen much swollen during the last two hours. Hot turpentine-stupes. Pulse 120, temperature 105°. Ten drops of each medicine hourly. 10 P. M.—Pulse 116, temperature 105°, respiration 15. Pain much less. Quinine, grs. 15, Magendie's solution and verat. virid., each, gtts. 5 hourly; vaginal injections with carbolic acid twice each day.

"Dr. A. A. Smith remained with the patient this and the following six nights, and also alternated with me in visiting her during the day. The following record was kept by us jointly:

"*May 6th*, 11 P. M.—Pulse 124, temperature 102.5°. Magendie and verat. virid., each, gtts. 5. 12 P. M.—Perspiring very freely. No pain. Has slept quietly for an hour. Pulse 120. Gave 5 drops of each medicine.

"*May 7th*, 1 A. M.—She is doing well, and has slept continuously. Respiration 11; there was not sufficient light to count the pulse, but it was estimated at 120. Magendie omitted, but gave verat. virid., 5 gtts. 2 A. M.—Sleeps all the time. Respiration 13, pulse 120. Says that she is hungry and took a cup of gruel. Verat. virid., gtts. 6. 3 A. M.—Pulse 92. At 3.30 awoke and began to vomit. Gave brandy and Vichy-water; sinapism to epigastrium. Gave five drops of Magendie. Nausea and vomiting kept up for an hour, during which the pulse ranged from 84 to 92. 4 A. M.—Pulse 84, temperature 102°, respiration 12. Vomiting stopped; sleeping. 5 A. M.—No vomiting, but sleeping quietly and perspiring freely. Respiration 12, but regular; pulse 84, pupils contracted. 6 A. M.—Asked for and drank a cup of tea. Pulse 92, respiration 13. 7 A. M.—Perspiring very freely. No nausea, and says that she feels well. Pulse 100, respiration 14, temperature 102.5°. Magendie and verat. virid., each, gtts. 5. 8 A. M.—Pulse 104. Feeling very comfortable. Took a cup of beef-tea. Magendie and verat. virid., each, gtts. 5. 10 A. M.—Pulse 92, respiration 14, temperature 102°. Quinine sulph., grs. 15. Turpentine-stupes to abdomen; five drops of the morphia and veratrum to be given every second hour. The lochia have never been offensive, but the discharge has nearly stopped. 2.30 P. M.—Pulse 80, temperature 101.5°. Abdomen softer and less swollen. Lochial discharge more free and more colored. 8 P. M.—Pulse 92, temperature 101°. Feels very comfortable. Gave quinine sulph., grs. 15. If bowels be not moved during the night, she is to take, early in the morning, hydrarg. chlor. mit., gr. 10, sodæ bicarb. ʒj, Magendie's solution and verat. virid., p. r. n. 10.30 P. M.—Pulse 96, temperature 102°. Complains of some pain in the right

iliac region. Magendie and verat. virid., gtts. 5 each. 12.30 A. M. —Has just awakened. Asked for food, and took a cup of beef-tea. Pulse 104. Magendie and verat. virid., gtts. 5 each.

"*May 8th*, 2.30 A. M.—She again awoke, complaining of severe pain in the right side. Gave Magendie, gtts. 5. The skin was hot and dry. The pain in the side is growing more and more severe. Gave solution of morphia and atropine, gtts. 12 hypodermically at 3 A. M. The pulse at that time was 120, temperature 105°. 6 A. M.—Has slept since the hypodermic injection. Pulse 112, temperature 103°. Took a cup of gruel, after which Magendie and verat. virid., gtts. 5. 8 A. M.—Says that she is very well. Pulse 104, temperature 103°. Took the powder of calomel and soda. 10 A. M.—Temperature 102.5°, pulse 100. Slight nausea and some cerebral excitement. After the bowels have moved, to have Magendie's solution, gtts. 5, and turpentine-stupes to be again applied. 2 P. M.—Bowels have moved very freely. Now sleeping quietly. Pulse 92, respiration 22, temperature 101.6°. To have, on awakening, quin. sulph., grs. 15, Magendie's solution, gtts. 5. 5.30 P. M.—Pulse 92, temperature 101.5°. Took a large cupful of chicken-soup. 10.30 P. M.—Pulse 108, respiration 22, temperature 105°. Gave quinine, grs. 10, Magendie's sol., gtts. 5. She took also a tumblerful of milk-punch.

"*May 9th*, 3.30 A. M.—She has slept since last note until a few minutes since, when she had a very large passage from the bowels. Says that she feels well. Took a cupful of beef-tea and nearly a tumblerful of milk-punch, made with sherry-wine. Pulse 92, temperature 100°. She has taken no medicine since 10.30 last night. 7.30 A. M.—Another full movement of the bowels. Pulse 96, temperature 100.5°. Magendie's solution, gtts. 5. A coffee-cupful of gruel. 11 A. M.—Pulse 92, temperature 101°. Quinine, grs. 15. 5 P. M.—She has had five dejections since noon, the last two being attended with a good deal of pain, and she is now suffering very much. Pulse 112, temperature 103.5°. Magendie's solution and verat. virid., each, gtts. 5, and the same to be repeated in one hour. 6 P. M.—No passage. Took two cups of farina and an ounce of brandy, Magendie's solution and verat. virid., each, gtts. 5. 8.30 P. M. —She has had three passages. She took bismuth subcarb., grs. 15, pulv. kino, grs. 5, Magendie's sol., gtts. 5. Pulse 120, temperature 103°. 11.30 P. M.—She has slept since last note. No movement of the bowels. Two cupfuls of farina. Magendie's solution, gtts. 5. Some pain in bowels. Hot fomentations, with laudanum applied to the abdomen.

"*May 10th*, 1 A. M.—Severe pain in bowels, with desire for passage. Bismuth and kino; Magendie's solution, gtts. 5. 3.30 A. M.—Another passage from the bowels, with enormous discharge of flatus. Took two cups of arrow-root, a glass of sherry, and Magendie's sol., gtts. 5. 4.30 A. M.—Magendie's solution, gtts. 5, with a tablespoonful of brandy. 7.30 A. M.—She has slept quietly since last note. Pulse 112, temperature 103°. She took a cup of coffee and a large cupful of chicken-broth. 10 A. M.—Pulse 100, temperature 103°. Took quinine, grs. 15, Magendie's solution, gtts. 5, every second hour. 3.30 P. M.—I was sent for hurriedly, the nurse and friends being greatly alarmed. She had been very comfortable, when she was awakened from sleep by a sudden start, and at once complained of agonizing pain in the abdomen, which I found excessively sensitive to pressure, and distended to a much greater degree than ever before. Gave a hypodermic injection of solution of morphia, gtts. 12 (morphia acetat., grs. 16, atropine, gr. 1, aquæ ℥ j), and applied turpentine-stupes. Pulse 132, temperature 105.5°. 5 P. M.—Magendie's solution and verat. virid., each, gtts. 5, to be repeated every hour. 8 P. M.—Pain much less, but great meteorism. Magendie's solution, gtts. 5, tinct. of verat. virid., gtts. 3, every hour. Took a cup of milk and a cup of mutton-broth. Pulse 108, temperature 103°. 11 P. M.—She has taken Magendie's solution and the veratrum viride every hour. Pulse 84, temperature 102°. She took a cupful of thickened milk, with a glass of sherry. 12 P. M.—She has not slept. Severe pain in the abdomen. Ten drops of solution of morphia and atropine hypodermically.

"*May 11th*, 2.15 A. M.—Ten drops of solution hypodermically. 5.15 A. M.—She has slept for two hours. Quin. sulph., gr. 10; solution of morphia and atropine, gtts. 10, hypodermically. A large cupful of farina and two tablespoonfuls of brandy in water. 8 A. M.—She has slept since last note. Took a cup of soup and a glass of sherry. Pulse 112, temperature 101°. She took a cup of farina and a glass of sherry. Quinine, grs. 10; continue Magendie's solution with verat. virid., gtts. 3. 4 P. M.—Pulse 84, temperature 100°. 9 P. M.—She has taken nutrition twice. Pulse 60. She now complains of nausea. She took Magendie's solution, gtts. 5, and a large glass of iced champagne. 11.30 P. M.—Has taken iced champagne twice, a cupful of chicken-soup, and five drops of Magendie's solution.

"*May 12th*, 3 A. M.—She slept quietly since last note. Magendie's solution, gtts. 5. 9 A. M.—Pulse 92, temperature 101°. She feels

very well and enjoys her food. Abdomen still enlarged, but with no pain and but slight tenderness.

"The decrease in the size of the abdomen was very slow, but after this time there was a steady, progressive improvement. The temperature ranged from 100° to 102° for the four succeeding days, after which it fell below 100°. The pulse, from this time, never rose so high as 100, and my attendance ceased two weeks from this date."

In some remarks on puerperal fever which were published in various medical journals sixteen years ago, I said that "the first indication is, to eliminate from the system as much of the morbid poison as is possible, by means of depletion and the other evacuants, as purgatives, emetics, and diuretics." Within a few years past, the conviction has gradually grown upon me that this is bad advice; first, because it is impracticable, and second, because the attempt to follow it may be positively injurious. The theory of eliminating from the system the poisons which cause the primary blood-changes in the essential diseases seems at first plausible; but, when the disease is developed, the poison has produced its effect, and, both from reasoning and observation, I am convinced that it is just as impossible to arrest puerperal fever by elimination, as it is to arrest, in this way, typhus or scarlet fever. While, then, the probability of any good being effected by such means is very small, the chances that positive harm may result from the attempt are very much less doubtful.

Let us examine somewhat in detail each method of elimination. In some epidemics, venesection has been relied upon as the chief and most important therapeutic measure, and better success seemed to be obtained by this means than by any other. This was the fact in certain epidemics described by Gordon, Hey, Armstrong, Campbell, and others; but it is the testimony of other equally sagacious observers of most epidemics

of puerperal fever of later times, that bloodletting could not be borne. I am very certain that, in the epidemics that I have seen, it would have been positively injurious. Still, in certain cases, venesection may be indicated, and a wise physician will carefully avoid exclusive routine practice. The same principle, as regards bloodletting, should govern our practice in this as in any other disease. Good sense, not theory, should be our guide. Venesection should never be resorted to simply because the case is one of puerperal fever, but because the symptoms indicate that vascular depletion is necessary. In a few cases, I have bled the patient to relieve severe cerebral symptoms. In one patient, puerperal fever was ushered in by a chill on the third day after delivery. On the fifth day, symptoms of cerebral congestion of the most alarming character were suddenly developed without premonition. I at once abstracted about thirty ounces of blood, with entire relief of the cerebral symptoms. The blood was analyzed by my friend, Professor Doremus, and found to contain an abnormal quantity of urea. Previous to her accouchement, the urine had several times been tested for albumen, but none was found. A few weeks since, I saw a lady in consultation, on the fourth day after confinement. Two days before, she had a prolonged chill, followed by severe abdominal pains, vomiting, and the other symptoms of puerperal fever. At the time of my visit, she was suffering from a severe headache, the pulse was hard and bounding, 116 per minute; the face was flushed, and the temperature was 104°. I learned that she had lost very little blood at the time of labor, and that, since the first day, there had been absolutely no lochial discharge. No urine could then be obtained for examination, but I was afterward

told that it contained a large amount of albumen. With some difficulty, I persuaded my friend, who had charge of the case, to open a vein and take away about a pint of blood. She was afterward treated with the acetate of potash, veratrum viride, and such other remedies as were indicated, and made a good recovery. This is the only instance where I have recommended venesection in the epidemic of this spring.

Leeches are very much employed by French and German practitioners for the purpose of subduing local inflammations; but I never advise them in this disease, as it is my belief that the various methods of accomplishing this result, which I have recommended in former lectures, are quite as efficient, and very much less annoying. I think it a good rule, in the treatment of disease, to do nothing which can add to the suffering and discomfort of a patient, if this can possibly be avoided.

Emetics at one time had a great reputation in the treatment of puerperal fever, and still have with French physicians, who make frequent use of ipecacuanha for this purpose. I have seen it tried in many cases, but have long since given it up in my own practice, for the reason that I have never seen it followed with any positive good results. I am convinced that every thing which perturbates or irritates the system, from which a positive good cannot be demonstrated as a result, should be avoided. Vomiting is one of the symptoms of the disease, and I cannot see that we gain any thing by aggravating any one of the symptoms. It is true that, under certain circumstances, the action of an emetic is followed by a cessation of vomiting, and therefore it is sometimes wise to give one for this purpose; but this is a very different thing from giving emetics to cure puerperal fever.

Purgatives have been extensively used in the treatment of this disease, and I think that no one who carefully reads the clinical reports that abound in medical literature can fail to come to the conclusion that there is no evidence of their utility, but abundant proof that they have been, in numerous instances, positively injurious. Take, for example, the classical work of Ferguson, and you will find several cases reported, where the action of castor-oil was followed by the development or aggravation of severe peritoneal irritation. If constipation exist, simple enemata are ordinarily sufficient to remove it. In some comparatively rare cases, where the tongue has a thick, pasty coat, and there is a good deal of bilious vomiting, with inability to retain nutriment, and the bowels have not moved for two or three days, I have given from five to ten grains of calomel, well rubbed up with twenty grains of bicarbonate of soda. This acts efficiently, but gently, as a laxative, and causes no pain or irritation. I can almost say that this is the only laxative that I ever give in puerperal fever, and, I may add, that it is only as a laxative that I ever give calomel in this disease.

Mercurials have been, and still are, advised by many authors. By some, mercury is supposed to be particularly efficacious in the treatment of phlebitic lesions, but I find no evidence that it is so, either from my own or the experience of others, neither can I discover any scientific reason why it should be of service in arresting phlebitis, peritonitis, or any other of the local inflammations.

I have made extensive trial of the sulphites, so highly recommended by Professor Polli, of Milan, but without any satisfactory evidence of their efficacy in the treatment of puerperal fever.

APPENDIX.

APPENDIX.

The fact that puerperal fever is specially liable to appear in lying-in hospitals, and that it sometimes occurs as an epidemic in connection with other zymotic diseases, particularly with erysipelas, is conceded by all. I think, also, that the majority of the profession believe that all those causes of nosocomial malaria, such as aggregation, bad ventilation, contact with septic material, etc., which have a tendency to induce septicæmia or pyæmia in surgical cases, have an equal tendency to develop the disease known as puerperal fever, in women recently confined.

Some writers assert that this disease never occurs, except under one or the other of the above conditions, and that it never appears as an epidemic, unless associated with some one of them.

During the early months of the present year, puerperal fever prevailed in the best parts of this city, and in that class of society possessed of abundant means and living under as good sanitary conditions as are possible in any large city, to a degree and extent here unknown for the past twenty-five years. Previous to this year, I think that this disease has been comparatively rare in those classes of society who are able to live well. From my observation, confirmed by all of the profession whom I have had an opportunity of interrogating on this subject, I feel warranted in saying that the disease seemed to attack, with equal severity, primiparæ and multiparæ, those in previous good health, as well as those who were feeble and delicate, those who had normal and easy labors equally with those in whom the labors were tedious and difficult.

It is impossible to ascertain what the comparative fatality of the disease was, but, from all the sources from which I could gain information, I made the estimate that one in five of those attacked died. Some of my professional acquaintances have expressed to me the belief that this estimate of the proportionate mortality is too high; but this was absolutely the proportion of deaths to the

number of cases mentioned to me by other physicians, added to the number which I saw, either in consultation or in my own private practice, the number of cases being ninety-five, and the number of deaths nineteen.

I think the profession in this city universally believe that puerperal fever can be transmitted by the physician from one patient to another, and consequently it cannot be doubted that every one took the greatest precaution to guard against so terrible a calamity. Certainly, no authentic evidence has come to my knowledge, that the disease tracked the practice of any one man during the epidemic of the present year.

Erysipelas was not epidemic in that part of the city where puerperal fever was rife, nor, indeed, in any part of the city, although there were a few sporadic cases. I may also mention that I have not seen a case of diphtheria for more than a year.

I was particularly impressed by the fact that, in Bellevue Hospital, a smaller proportion of puerperal women were attacked by the fever than in several former epidemics that I have encountered in the hospital, and that dispensary physicians did not speak of the disease as being of remarkable frequency in the crowded and poorer quarters of the city.

These facts struck me as so singular, that I addressed a note to my friend, Dr. Charles P. Russel, then Register of the Board of Health, having charge of the Bureau of Records of Vital Statistics, inquiring if he could furnish me with a record of deaths for the first four months of 1873, reported as due to puerperal fever or puerperal septicæmia, and also those reported as of puerperal peritonitis, metro-phlebitis, etc., so as to include all the metria, to adopt the term used by the Registrar-General of Great Britain. I further inquired whether the Bureau of Records could give any information as to the comparative mortality in different parts of the city, and as to the social status of those who died. In reply, Dr. Russel had the tables prepared for me, which I append. They were made out by non-professional officials, who had no theory to support, and who were quite ignorant of the use that was to be made of them.

These tables seem to me very remarkable and significant. In Table I., the total number of deaths is 62, of which 33 occurred in the Nineteenth, Twentieth, Twenty-first, Twenty-second, and Twelfth Wards. These wards embrace that part of the city north of Twenty-sixth Street. The population of these wards, according to the census of 1870, was as follows:

Twenty-second Ward	71,349
Nineteenth Ward	86,090
Twentieth Ward	75,407
Twenty-first Ward	56,703
Twelfth Ward	47,497
Total	337,046

The population of the whole city was, at this time, 942,292. Thus it will be seen that, in a population of 337,046, there were reported 33 deaths, while in the remaining part of the city, with a population of 605,246, there were but 29 deaths.

In Table II., the total mortality was 81, and 47 of these deaths occurred in the same five wards.

In Table III., the total mortality is 143, and the deaths in the five wards were 80.

The residences of those who have an annual income of over $5,000 are almost exclusively in the Fifteenth, Sixteenth, Eighteenth, Nineteenth, Twentieth, Twenty-first, Twenty-second and Twelfth Wards, and a large majority of these are in the last five wards. In these, as compared with many others, there are proportionally few of the class of dwellings known as tenement-houses, in which the poor are aggregated. From statistics furnished me by my friend, Dr. Stephen Smith, member of the Board of Health, I find the population to the square acre to be in the—

Nineteenth Ward	56
Twentieth Ward	173
Twenty-first Ward	120
Twenty-second Ward	50
Twelfth Ward	21

This is in striking contrast with the population to the square acre in some of the other wards; and, to make this more clear, I give a comparative exhibit of the population to the square acre, of the poorer classes of New York and London:

Eleventh Ward	328	Strand	307
Thirteenth Ward	311	St. Luke's	259
Fourteenth Ward	275	East London	266
Seventeenth Ward	289	Holborn	229

I found it impossible to get the number of births in each ward during the period included in these tables, as they are not registered by wards; but the whole number of births registered in the city, for

this period, was 8,238. If the number of births in the five wards first indicated be estimated by the ratio to the population, it will be 2,946.

Assuming this number to be nearly correct, these tables prove that in five of the best wards in the city, as regards wealth and aggregation, there were 80 deaths from metria, in 2,946 births, from January 1 to May 15, 1873, or 1 in 36.8; while, during the same period in the rest of the city, there were 63 deaths from the same cause, in 5,292 births, or 1 in 84.

Table IV. offers a most curious and significant contrast to the above results. In the five wards, the number of deaths certified as from childbirth, rupture of the uterus, hemorrhage, placenta prævia, and puerperal convulsions, was 20, or 1 death in 147.3 births; while, in the other parts of the city, in which mainly the poor reside, who are unable always to command skilled obstetrical assistance, the deaths were 1 in 79 births.

TABLE I.

Deaths certified as by Puerperal Fever and Puerperal Septicæmia in the City of New York, from January 1 to May 15, 1873.

Mortality in Different Wards.

First ward.	Fourth ward.	Seventh ward.	Eighth ward.	Ninth ward.	Tenth ward.	Eleventh ward.	Twelfth ward.	Thirteenth ward.	Fifteenth ward.	Sixteenth ward.	Seventeenth ward.	Eighteenth ward.	Nineteenth ward.	Twentieth ward.	Twenty-first ward.	Twenty-second ward.	Total Deaths.
2	1	1	1	2	1	3	4	1	1	2	8	6	9	7	7	6	62

Mortality in Different Classes of Dwellings and Public Institutions.

IN HOUSES OF														Colored Home Hospital.	Bellevue Hospital.	Small-pox Hospital.	Nursery and Child's Hosp.	Ward's Island Hospital.	Hotels, Boarding-houses.	Total Deaths.
One family.	Two families.	Three families.	Four families.	Five families.	Six families.	Seven families.	Eight families.	Ten families.	Twelve families.	Thirteen families.	Fourteen families.	Sixteen families.	Eighteen families.	Twenty families.							
4	1	4	2	2	6	2	6	2	3	1	6	4	3	1	2	4	1	3	2	3	62

TABLE II.

Deaths certified as Puerperal Metritis, Puerperal Peritonitis, and Puerperal Metro-peritonitis, from January 1 to May 15, 1873.

Mortality in Different Wards.

First ward.	Fifth ward.	Sixth ward.	Seventh ward.	Eighth ward.	Ninth ward.	Tenth ward.	Eleventh ward.	Twelfth ward.	Thirteenth ward.	Fifteenth ward.	Sixteenth ward.	Seventeenth ward.	Eighteenth ward.	Nineteenth ward.	Twentieth ward.	Twenty-first ward.	Twenty-second ward.	Total Deaths.
1	1	3	2	1	1	4	5	6	1	2	2	10	1	8	12	8	13	81

Mortality in Different Classes of Dwellings and Public Institutions.

IN HOUSES OF																		
One family.	Two families.	Three families.	Four families.	Five families.	Six families.	Seven families.	Eight families.	Nine families.	Ten families.	Twelve families.	Thirteen families.	Fourteen families.	Sixteen families.	Eighteen families.	Twenty families.	Twenty-four families.	Park Hospital.	Nursery and Child's Hosp.	Ward's Island Hospital.	Bellevue Hospital.	Total Deaths.
9	3	10	11	4	6	4	6	1	2	3	1	1	4	3	2	1	1	1	3	5	81

Table III.

Total Deaths by the Various Forms of Puerperal Fever (including Puerperal Fever, Puerperal Septicæmia, Puerperal Metritis, Puerperal Peritonitis, and Puerperal Metro-peritonitis) as given in Tables I. and II., from January 1 to May 15, 1873.

Mortality in Different Wards.

First ward.	Fourth ward.	Fifth ward.	Sixth ward.	Seventh ward.	Eighth ward.	Ninth ward.	Tenth ward.	Eleventh ward.	Twelfth ward.	Thirteenth ward.	Fifteenth ward.	Sixteenth ward.	Seventeenth ward.	Eighteenth ward.	Nineteenth ward.	Twentieth ward.	Twenty-first ward.	Twenty-second ward.	Total Deaths.
3	1	1	3	3	2	3	5	8	10	2	3	4	18	7	17	19	15	19	143

Mortality in Different Classes of Dwellings and Public Institutions.

IN HOUSES OF																			
One family.	Two families.	Three families.	Four families.	Five families.	Six families.	Seven families.	Eight families.	Nine families.	Ten families.	Twelve families.	Thirteen families.	Fourteen families.	Sixteen families.	Eighteen families.	Twenty families.	Twenty-four families.	Bellevue Hospital.	Colored Home Hospital.	Small-pox Hospital.	Nursery and Child's Hosp.	Ward's Island Hospital.	Park Hospital.	Hotels, Boarding-houses.	Total Deaths.
13	4	14	13	6	12	6	12	1	4	6	2	7	8	6	3	1	9	2	1	4	5	1	3	143

TABLE IV.

Deaths certified as from Childbirth, Rupture of Uterus, Hemorrhage, Placenta Prævia, and Puerperal Convulsions, from January 1 to May 15, 1873.

Mortality in Different Wards.

First ward.	Fourth ward.	Fifth ward.	Sixth ward.	Seventh ward.	Eighth ward.	Ninth ward.	Tenth ward.	Eleventh ward.	Twelfth ward.	Thirteenth ward.	Fourteenth ward.	Fifteenth ward.	Sixteenth ward.	Seventeenth ward.	Eighteenth ward.	Nineteenth ward.	Twentieth ward.	Twenty-first ward.	Twenty-second ward.	Total Deaths.
1	5	8	2	1	5	3	2	6	11	11	6	2	4	7	4	5	1	2	1	87

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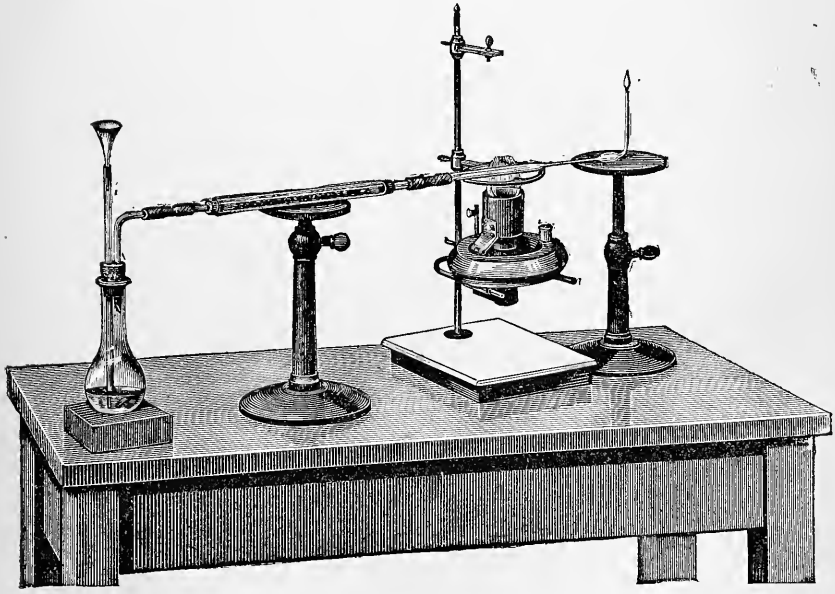

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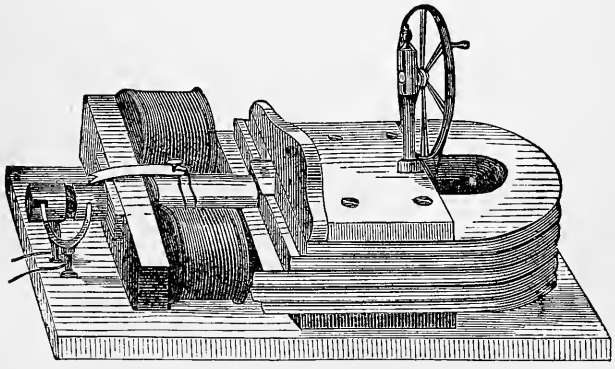

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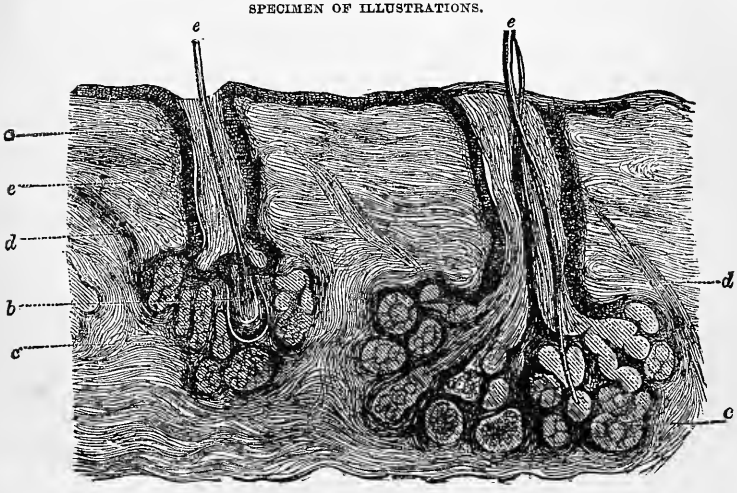

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